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ABSTRACT

The meeting reported in this document focused on the relevance of education to societal requirements, training of educational personnel, distance education, and ways for teacher education to serve the needs of disadvantaged population groups. Countries represented included: Australia, Bangladesh, China, India, Indonesia, Iran (Islamic Republic), Lao PDR, Malaysia, Maldives, Myanmar, Nepal, Pakistan, Papua New Guinea, Phillipines, Republic of Korea, Samoa, Sri Lanka, Thailand, and the Socialist Republic of Viet Nam. The document is organized into the following nine chapters: (1) "Introduction"; (2) "Country Experiences"; (3) "Towards Developing New Teacher Competencies in Responses to Mega-Trends in Curriculum Reforms"; (4) "Mega-Trend in Curriculum Reforms in Science and Mathematics"; (5) "Mega-Trend in Curriculum Reforms in Social Sciences and Languages"; (6) "Teacher Education Reaching Out to Educationally Disadvantaged Groups"; (7) "Teacher Education via Distance Education"; (8) "Proposed Restructuring of Teacher Education"; and (9) "Recommendations." Appendixes provide the meeting agenda, a list of participants, speeches, and schools and development projects participants visited. (LL)

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Report of a
Regional Study Group Meeting
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Chiang Rai, Thailand
25 June to 6 July 1990

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C O N T E N T S

Chapter One : Introduction

- *Background* 1
- *Objectives* 1
- *Participation* 1
- *Inauguration* 2
- *Officers of the Meeting* 3
- *Working methods of the Meeting* 3
- *Closing programme* 3

Chapter Two : Country Experiences

- *Synthesis of the country reports* 4
- *Recent innovations in teacher education* 43
- *Major problems and issues* 49

Chapter Three : Towards Developing New Teacher Competencies in Response to Mega-Trends in Curriculum Reforms

- *Introduction* 53
- *Conceptual framework* 55
- *Mega-trends in curriculum reforms* 58
- *Competencies required of teachers* 61
- *Teacher education in support of Mega-trends* 64
- *Illustrative examples* 66

Chapter Four : Mega-Trend in Curriculum Reforms in Science and Mathematics 130

Chapter Five : Mega-Trend in Curriculum Reforms in Social Sciences and Languages 149

C O N T E N T S (cont'd)

Chapter Six	:	Teacher Education Reaching Out to Educationally Disadvantaged Groups	171
Chapter Seven	:	Teacher Education via Distance Education . . .	178
Chapter Eight	:	Proposed Restructuring of Teacher Education . .	183
Chapter Nine	:	Recommendations	187

Annexs

Annex 1	:	Agenda	191
Annex 2	:	List of Participants	192
Annex 3	:	Speeches	197
Annex 4	:	Schools and Development Projects Visited . . .	203

Chapter One

INTRODUCTION

Background

The Tenth Regional Consultation Meeting on Asia and the Pacific Programme of Educational Innovation for Development (APEID) identified making education relevant to societal requirements, the training of educational personnel including professional support services and distance education, and finding ways for teacher education to serve the particular needs of disadvantaged population groups, as some important areas of concern to be examined during the fourth programming cycle (1987-1991).

In accordance with the 1990 APEID Work Plan, UNESCO PROAP, through its Asian Centre of Educational Innovation for Development (ACEID), convened in Chiang Rai, Thailand, a Regional Study Group Meeting on Teacher Education, in collaboration with the Ministry of Education, Thailand, and the Chiang Rai Teachers College, from 25 June to 6 July 1990.

Objectives

- The main objectives of the Meeting were to:
- identify competencies required of teachers in the context of recent curricular reforms; and to suggest strategies and prepare sample materials for the development of such competencies;
- identify needs and requirements in teacher education emerging from teacher education reforms including efforts at reaching out to disadvantaged groups and to examine how such needs and requirements could be met; and
- review and evaluate what has been done since 1987 in the training of educational personnel including teacher education via distance education.

The agenda of the Meeting is in Annex 1.

Participation

The Meeting was attended by 33 resource persons and participants and two observers from 19 countries, namely: Australia, Bangladesh, China, India, Indonesia,

Iran (Islamic Republic), Lao PDR, Malaysia, Maldives, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Samoa, Sri Lanka, Thailand, and Socialist Republic of Viet Nam. The list of participants is presented in Annex 2.

Inauguration

In his inaugural address, Mr. Sakul Sriprom, Deputy Minister of Education, Ministry of Education, Thailand, welcomed participants to the Meeting. He went on to say that the Thai Government places great emphasis on the importance of teacher education keeping abreast of changes in the curriculum taught in schools in order that young people are adequately educated to meet the needs of a changing society. He also noted that the Thai Government will make every effort with regard to the provision of adequate financial and human resources to strengthen teachers colleges throughout the country in order to further assist them in becoming local centres for the development of education at the grassroots level.

His Excellency the Governor of Chiang Rai Province, Mr. Banasit Salab-sang, delivered a welcome speech in which he said that the province was honoured to be the venue of this UNESCO Meeting. He outlined the various tourist and other attractions of Chiang Rai, and said that he hoped to have the pleasure of welcoming other such meetings in the future.

In providing an overview of the Meeting, Mr. Intr Srikun, Deputy Director-General, Teacher Education Department, Ministry of Education, Thailand outlined the objectives of the Regional Study Group Meeting, these being: to identify competencies required of teachers in the context of recent curricular reforms, and to suggest strategies and sample materials for the development of such competencies; to identify the needs and requirements in teacher education emerging from teacher education reforms, including efforts at reaching out to disadvantaged population groups; and, to review and evaluate what has been done since 1987 in the training of educational personnel including the implementation of teacher education via distance learning programmes.

In his address, Mr. Hedayat Ahmed, Director of the UNESCO Principal Regional Office for Asia and the Pacific, said it is now widely recognized that the quality of any school system ultimately depends upon the knowledge, skills and capabilities of its teachers. However, despite this recognition, at the current time the relatively low salaries paid to teachers, the poor conditions under which many of them work, and their relatively low social status in society (when compared to other occupations requiring a similar level of formal education and professional training) is making it very difficult for most countries to attract talented young people into the occupation or to keep the best teachers within the service. Mr. Ahmed said that over the last decade attempts have been made by curriculum developers in many countries to develop content and materials for use in schools that seek to be effective instruments for promoting economic development, social change, and social cohesion. Yet such important goals have generally not been fully realized. He speculated that one of the main reasons for this may be that teachers have not been an adequate vehicle for achieving such

curricular changes, and said that if this is the case then part of the blame rests with teacher educators at both the pre-service and in-service levels. A contributing factor to this state of affairs may be that teacher education tends to thrive more on an "encyclopedia of mythologies" than on an "encyclopedia of knowledge" with the result that the approach adopted is often a theoretical and a scientific rather than rigorous and systematic.

The speeches presented are in Annex 3.

Officers of the Meeting

The Meeting unanimously elected Assistant Professor Suthep Pongsriwat (Thailand) as Chairperson; Dr. Lee Don Hee (Republic of Korea) and Mr. Benny Karyadi (Indonesia) as Vice-Chairpersons; and Dr.(Mrs.) Daljit Gupta (India) as Rapporteur General. The two Vice-Chairpersons also served as Chairpersons of the two working groups. The working groups elected Assistant Professor Amnat Chanpan (Thailand) and Mr. Zafar Saeed (Pakistan), Vice Chairpersons; and Mrs. Amelita Cruz (Philippines) and Mrs. FaataFao Toia (Samoa), Rapporteurs.

Working Methods of the Meeting

After sharing the experiences of different countries, and the presentation of the working document prepared by the Technical Working Group, two working groups were formed to deliberate on Agenda Item 5. Group 1 examined mega-trends in curriculum reform, and the implications of these for teacher competencies and the development of teaching and learning materials to develop these, in the natural sciences and mathematics, while group 2 examined the same matters with regard to the social sciences and languages.

The list of the working group members is contained in Annex 4. In addition, the Meeting held three plenary sessions.

The participants, resource persons and observers also made study visits to schools and development projects in Chiang Rai. The places visited are described in Annex 5.

Closing Programme

The Draft Report, including the outputs of the Meeting was discussed during the afternoon of Thursday, 5 July 1990. Suggestions were made to improve different chapters of the Draft Report.

A Closing Programme was held on 6 July 1990, with the Governor of Chiang Rai as Chief Guest.

The Chairperson, Vice Chairpersons and some participants also spoke during the Closing Programme. The Head, UNESCO Asian Centre of Educational Innovation for Development (ACEID) delivered the response on behalf of UNESCO PROAP.

Chapter Two

COUNTRY EXPERIENCES

The first two days of the Regional Study Group Meeting on Teacher Education was devoted to the sharing of country experiences with specific reference to the main thrusts of the Meeting: that is, i) the responsiveness of teacher education to curricular reforms, ii) how teacher education is reaching out to the educationally disadvantaged groups, and iii) modalities for upgrading qualifications and sustaining professional growth of teachers.

Highlights of the country papers were presented followed by a lively discussion. As most of the country reports were voluminous, it was not possible to include everything in the report of the Meeting. Each country delegation was therefore requested to prepare a summary of their country paper. These summaries are presented in the first section of this Chapter.

The second section of this Chapter consists of a brief description of the priority innovations in teacher education. These innovations were culled out from the country presentations and discussed thoroughly in three working groups.

The third and last section of this Chapter consists of problems and issues which emerged from the discussions of the country papers.

Bangladesh

Curricular Reforms

Reforms in Primary Education. Being cognizant of the importance of the qualitative aspects of the Universalization of Primary Education and the positive effects of quality improvement on enrolment and retention, a major programme of curriculum renewal and modification was undertaken in Bangladesh in 1986. In the past three years, the National Curriculum and Textbook Board completed its work on developing an Essential Learning Continua (ELC) based on essential learning competencies for the primary level of education. All the other curriculum components such as, teaching-learning strategies, techniques and methods for the continuous assessment of pupils, and instructional materials for students and teachers, have been planned and developed within the framework of ELC.

Reforms in Secondary Education. During the nineteen eighties substantial modifications in the secondary science curriculum took place. The new curriculum placed greater emphasis on the elements of inquiry, observation and experimentation in science education. To make science education more life oriented an attempt was made to include in the instructional materials, examples and problems related to the everyday living of the pupils. New textbooks and teachers' guides have been prepared based on the curriculum and syllabus. In both textbook and teachers' guide activity-based and inquiry-oriented teaching-learning are reflected.

Teacher Competencies

The competencies required of teachers for effective implementation of the reforms are the following:

Primary Level

1. To plan and apply learner-centred and development oriented teaching-learning methods;
2. To use the pupil's environment in the teaching-learning process;
3. To identify learning difficulties of the pupils;
4. To apply appropriate remedial measures whenever necessary; and
5. To use suitable techniques and methods in assessing pupils achievement in scholastic and non-scholastic areas.

Secondary Level

1. To use teachers' guides effectively;
2. To arrange and guide practical work in an effective way;
3. To design and develop simple teaching aids using locally available low-cost or no cost materials; and
4. To develop suitable instruments for assessing pupil's achievement in learning concepts, developing process skills and a scientific attitude.

Needs and Requirements

1. In the primary and secondary levels of the educational system of Bangladesh, by and large females belong to the educationally disadvantaged population group. Being disadvantaged within the context of socio-cultural and economic perspectives. The Government of Bangladesh recently has taken two positive measures for the promotion of female education. The Government has decided to recruit 60 per cent of female teachers for primary schools. And to ensure more enrolment of females and to promote female education the Government declared

free education for females up to grade VIII in non-municipal areas of the Bangladesh.

2. In the implementation of the two measures, teachers to be recruited in the primary and secondary levels should be given adequate training.

3. The teaching-learning materials should be developed and the curriculum and syllabus for the teachers of these population group should be planned to ensure the promotion of female education. The competencies mentioned below should be incorporated in teacher education courses

   a) Teachers should be able to identify the problems of the female learners coming from rural and urban areas.

   b) Teachers should be able to overcome sex bias attitudes in school classrooms, in families and in community.

4. Teachers should be able to create awareness in the society in the context of socio-cultural and religious background.

5. Teachers should be acquainted with the needs and aspirations of the society.

6. On the other hand, the content of education for females should be useful and relevant to meet the needs and demands of society.

Another educationally, socially and economically disadvantaged population group in our country are the street children who are working boys and girls from 6-14 years old. They are called *'Pathakate'* (blooming flowers of the streets). The Government has taken an innovative programme for the education of the street children, Pathakali schools being established in various parts of the country to cater for their needs. A curriculum for working boys and girls who come from the slums of urban and semi-urban has been developed by the National Curriculum and Textbook Board, special teachers being needed for the implementation of this innovative programme.

Strategies and Materials

1. *Pre-service Training of Teachers.* Primary school teachers are required to have 10 to 12 years of general schooling and one year of professional training. Secondary teachers are required to have a minimum of first degree from a general university (14 years of general education) plus one year of professional training. Fifty-three Primary Training Institutes (PTI) and 10 Teachers Training Colleges (TTC) are entrusted with the responsibility to provide professional training to the primary and secondary school teachers, respectively. After successful completion of the professional training course, primary teachers get Certificate in Education and secondary teachers get Bachelor of Education degree.

2. *Bangladesh Institute of Distance Education* has introduced an experimental two-year Bachelor of Education degree programme through distance

education for working teachers of secondary schools. The programme has been in operation since 1985. So far about 10,000 student-teachers had been admitted in this programme. The two-year programme is divided into four semesters. At the end of each semester the students are required to take semester final examination.

3. The Institute of Education and Research, University of Dhaka, has been providing training to mostly secondary schools teachers leading to Diploma-in-Education which is equivalent to Bachelor of Education degree. The duration of the course is one academic year.

4. To cope with the new competency-based primary curriculum, modification of the teacher education curricula is underway. The National Academy for Primary Education (NAPE), and PTIs organize in-service training courses for primary teachers; while for the effective implementation of the new primary curriculum, the Directorate of Primary Education has launched a dissemination programme for the transaction of the new competency based curriculum through its field network. This programme will provide short training courses for teacher educators, supervisors, head teachers and classroom teachers. The following materials shall be used as training-cum-reference materials: national workshop report on ELC; essential learning continuum; continuous pupils assessment (CPA) scheme; CPA register; teaching-learning strategies; learning difficulties in language with remedial teaching for mastery learning; learning difficulties in mathematics with remedial teaching for mastery learning; draft version of learning materials; and a training manual.

Since the introduction of the new secondary curriculum, in-service training courses of varying types and duration have been launched to assist teacher educators and classroom teachers to cope with the content and new approaches of teaching.

China (People's Republic of)

Curricular Reforms

The major curriculum reforms that have occurred at the primary and secondary levels that have been undertaken are based on the following principles:

- To change the traditional concept of "pursuing education for its own sake" to viewing 'education' as a means to improving the quality of man.
- To help make education serve local economic development.
- Developing students not only academically but also in terms of their vocational and technical skills.
- Implementation of nine-year compulsory education by the Year 2000.

- Increasing the application of modern educational theories and technology.

Great difficulties are encountered in implementing basic education for all in the rural areas, particularly in the mountainous areas, the nomadic regions and the minority nationality regions.

Teacher Competencies

It is believed that the major teacher competencies that need to be developed include:

- a practical ability to handle the day-to-day situations that arise in classroom and schools;
- the teacher developing a knowledge about his/her own field of study as well as local subject matter and some essential skills and techniques required in the economic activities of the locality;
- our ability to teach two or more subjects;
- multi-grade teaching capability;
- the ability to manage a whole school with particular reference to the needs of one-teacher schools;
- the conducting of educational research;
- the use of modern teaching-learning strategies and techniques; and
- making effective teaching-learning aids.

Teacher Education

In response to the curricular changes occurring in schools the needs and requirements in teacher education are as follows: the training curriculum needs to be changed; training methodologies need to be changed; and management systems need to be improved.

For the pre-service training of primary school/teachers the three year normal school curriculum has been revised in response to curriculum reform that has occurred in primary schools. Included in this revision are the following strategies

- decentralization of authority in the selection of elective courses (and their contents) in order to meet local needs;
- provision for inclusion of local content in both compulsory and elective courses;
- enhancement of teacher education; and
- emphasis on the acquisition of practical skills.

For the pre-service training of junior middle school teachers at junior normal colleges, attempts are made to readjust requirements regarding the selection of subjects for specialization. Some colleges have started to implement a system of majors and minors and a system of double majors, the purpose of this readjustment being to enable trainees to develop competencies to teach more than one subject.

Many practicing teachers do not have sufficient professional training, and so the China TV Normal College operation on the open university or distance learning mode offers training to these teachers, both degree and non-degree courses being available.

Currently a number of areas are being given special attention at both the pre-service and in-service training, these being:

- foundation courses in education such as educational psychology, pedagogy, textbook analysis and teaching methods;
- an emphasis on the cultivating of teacher's morality and encouraging teachers to love their jobs and to devote themselves fully to their duties;
- an emphasis on educational research and the offering of examples and guidance for educational reforms and innovations in primary and middle schools;
- training in practice abilities including setting up bases for practical teaching and guidance for practical teaching;
- training of basic skills and abilities required by a teacher such as oral competency, writing on the blackboard, drawing, making teaching-learning aids and instruments for experiments, managing a class; and
- knowledge about the characteristics of children and adolescents.

India

Consequent upon the declaration of the National Policy on Education in 1986, a National System of Education based on a common educational structure (10 + 2 + 3), a national curriculum framework and minimum levels of learning for each stage has been adopted. The national curricular framework comprises a common core along with other components that are flexible. It aims at providing a broad-based general education to all learners through a common scheme of studies, and places an emphasizes on the provision of essential facilities, child-centred and activity-based processes, continuous and comprehensive evaluation, and applicability of the curriculum to all learners to ensure comparability of attainment.

Major Curricular Changes and Teacher Competencies

The universalization of elementary education is the top priority in school education. Its major components being: the enrolment of all children in the 6-14

age-group; their retention in school during the compulsory education period; and the attainment of minimum levels of learning by each learner. In view of the high rate of drop-out at this stage, the thrust has been shifted from quantitative expansion to qualitative improvement in the school system.

The scheme of studies at this stage includes the teaching of language (one at primary stage and three at upper primary stage), mathematics, environmental studies (classes I-V), social sciences (classes VI-VIII), work experience, art education, health and physical education.

Secondary education comprises the last two years of general education. The scheme of studies comprises three languages, mathematics, science, social sciences, work experience, art education, health and physical education.

To help attain the target of universalization of elementary education and to help learners attain the minimum learning outcomes in the cognitive, affective and psychomoter domains, competencies need to be developed in teachers related to: developing closer relationship between school and community; planning strategies and activities for instructional programme in the different subject areas; adopting techniques of teaching that involve active participation of all learners (play-activities, discussions, individual/group assignments, etc.); selecting, procuring, improvising and using learning materials available in the school/environment; developing attitudes, values, habits necessary for the all round development of learners; constructing and using various tools and techniques for continuous and comprehensive evaluation of attainment of learners, diagnosing the difficulty areas and planning remedial measures; using multi-group/multi-grade teaching strategies; helping learners to apply knowledge, principles, processes and methods to solve academic and day-to-day problems and so improve the quality of life of individuals and the community; planning strategies and activities to provide educational, personal, social and vocational guidance to learners; and identifying the gifted children, slow learners, low achievers and assisting them according to their needs.

Education of Disadvantaged Groups

Increasing enrolment and retention rates for girls and children from the socially and economically disadvantaged groups of society have been major hazards in achieving the targets of universalization of elementary education. To help overcome this problem it is believed that the teacher must have competencies related to:

- identification of the specific educational needs of these children with reference to their social, economic and environmental conditions; planning strategies and activities according to these needs;
- sensitization of parents/community to the significance of education; seeking their co-operation in the enrolment of their children, provision of schooling facilities and their maintenance;
- communication in the local language/dialect;

- acting as a link between the community and the various developmental agencies.

Teacher Training Strategies

This takes the forms of:

- Pre-service training programmes;
- In-service training programmes;
- Distance learning programmes; and
- Self-learning/in-school and intra-school.

Infrastructure

The major interventions are:

- The establishment of District Institutes of Education and Training (DIETS);
- Strengthening of Colleges of Teacher Education (CTES);
- Upgrading some CTES into Institutes of Advanced Study of Education (IASE);
- Strengthening of State Councils of Educational Research and Training (SCERTS); and
- Setting up of University Departments of Education.

Sample Materials

Sample materials have been developed in the form of: frameworks for curriculum for the elementary and secondary stages, and teacher education, guidelines for developing curriculum and exemplar materials for school and teacher education; and, teacher training packages for in-service training programmes.

Indonesia

Over the last two decades, education in Indonesia has experienced many changes, both in terms of quantity and quality. However, changes in quantity aspects of education were faster than the quality. And so, since 1984, the Government of the Republic of Indonesia has adopted an educational policy in which the improvement of quality of education occupied a high priority. The policy has given rise to several issues in education, such as curriculum reform, teacher competencies, and pre-service and in-service teacher education.

Curriculum Reforms

The present primary and secondary school curricula in Indonesia were originally prepared in 1975. The primary school curriculum consisted of nine subject areas, namely: religion, Pancasila moral education, Bahasa Indonesia (Indonesian language), social studies, mathematics, science, sport and health, art and skills training. The junior secondary school curriculum has three field of studies: (1) general education; (2) academic education; and (3) skill training. On the other hand, the senior secondary school curriculum has three field of studies, namely: general education, academic education; and elective subjects. The main thrust of the curriculum is on the acquisition of knowledge which embrace moral values and skills development.

A major curriculum reform took place in 1984. The emphasis of the revised curriculum was on greater student involvement and its focus was on the process of learning as well as on the curriculum content. The foci of the reform was focused on three fundamental curricular concepts, namely: (i) programmes; (2) production; and (3) process. All of the foregoing resulted on certain curricular changes which in effect introduced changes on the following: (1) scope of curriculum; (2) sequence of curriculum; (3) complexity of the curriculum; and (4) the role of teachers.

In 1989, the Government of the Republic of Indonesia has adopted a new educational policy, in which basic education shall be expanded from six to nine years in 1994. In line with this new policy all school curricula are being evaluated and revised and the basic course outline, shall be distributed in 1992.

Major Teacher Competencies

Teacher Education Institutions in Indonesia (SPG, IKIP and FKIP) have implemented the Competency Based Teacher Education (PGBK). This new approach in teacher education aims to meet the needs of the school curricular reforms. There are two major issues in the new teacher education approach. Firstly, the implementation of 10 teacher's competences in all its programmes, and secondly restructuring the curriculum of teacher education. The ten teacher competencies are the following:

1. *Personality development*
   - to enhance full devotion to God Almighty
   - to develop the best attitude toward society
2. *Understanding of Educational Foundations*
   - to understand the aims of national education and the institutional goals of primary and secondary schools
   - to understand the function of schools in the society
   - to understand the principles of educational psychology which has application in the teaching-learning processes.

3. *Curricular Content*

   - to come out with comprehensive curriculum content in the different subjects
   - to come out with enriched curricular and to provide remedial programme activities for students

4. *Teaching Programmes Development*

   - to understand the general instructional objectives and to be able to formulate the specific ones
   - to be able to select and develop relevant content analysis in accordance with the goals of education
   - to be able to select and develop teaching-learning strategies
   - to be able to select and develop relevant instructional media teaching materials
   - to be able to select and use available learning resources

5. *Execution of Teaching Programmes*

   - to be able to create an atmosphere conducive to learning in the classroom
   - to be able to manage the classroom effectively
   - to develop good student-teacher and student-student relationships

6. *Learning Outcomes*

   - be able to evaluate students' learning outcomes and use it as feedback for improving the teaching-learning processes
   - be able to define the level of mastery of each student

7. *Guidance and counseling (G&C)*

   - to provide guidance services to students who have difficulties in learning
   - to understand the basic principles in G&C
   - to be able to help the disabled as well as the talented/gifted students
   - provide orientation to students to appreciate the different kind of jobs that are available in the community

8. *School Administration*

   - to know about the basic principles of school administration
   - to be able to do basic school administration

9. *Colleagues and Society*

   - to be able to work cooperatively with colleagues towards the improvement of their professional competencies
   - to be able to interact with the society towards the fulfillment of the educational missions

10. *Researches*

   - to understand the basic concepts of scientific research
   - to be able to conduct simple actions researches to improve the quality of teaching-learning experiences.

Needs and Requirements

Over the years, Indonesian educators attempted to do the following to meet the needs and requirements:

The teachers in Indonesian schools had been prepared by two government departments, namely: the Department of Education and Culture and the Department of Religious Affairs. The Department of Religious Affairs is responsible for preparing teachers to teach religion while the teachers for the other subject are prepared by the Department of Education and Culture. Within the Department of Education and Culture there are two Directorates General responsible for teacher education. Teachers for primary school are prepared by the Directorate General of Primary and Secondary Education and teachers for secondary school are prepared by the Directorate General of Higher Education. However, starting in 1990, the teachers for all levels of education shall be prepared by the Directorate General of Higher Education. Pre-service teachers education programme is fully conducted by IKIPs and FKIPs, both public and private.

In line with the policy of better quality of education, the Diploma-1 and Diploma-2 for secondary teachers have been abolished. In the next five years, the Diploma-3 shall also be abolished. The standard qualification for secondary teacher is Strata-1 programme (four years degree programmes).

Pre-service primary teacher education will be a two year non-degree programme (Diploma-2), which will be conducted by IKIPs and FKIPs.

Strategies and Materials

1. In-service teacher education is conducted by the Directorate General of Primary and Secondary Education and the Open University (UT).
2. Recently, a variety of schemes has been developed nation wide, such as the establishment of district level training centres, the establishment Teachers' Club and Principal's Club. These training centres acted as a resource centres providing information and a base for the inspectors to meet and discuss progress and new ideas.

3. In some areas, due to geographical problems, sub-teacher's centres were also opened. The Teacher's Centres are under supervision of the District Office of the Department of Education and Culture.
4. The Faculty of Education of the Open University (UT) also conduct in-service teacher education for secondary school teachers as well as primary school teachers.
5. UT offers 8 non-degree programmes and 6 degree programmes for secondary teacher and one non-degree programme for primary teachers.

Iran (Islamic Republic of)

Introduction

The Constitution of the Islamic Republic of Iran, which was inspired by Prophet Muhammad's (S.A.W.) teachings, attributes great importance to the education of the Iranian people. Several articles of the Constitution refers to this matter.

Iran is a vast and mountainous country with more than 500 towns and townships as well as 55,000 villages. Geographical conditions have always been one of the obstacles supplying teachers for the less populated and scattered villages of the country.

Accordingly after the Islamic revolution in Iran some reforms have been introduced at the primary school level (grades 1 to 5), guidance cycle (grades 6 to 8) and higher secondary school level (grades 9 to 12) which have also some implications to teacher education.

Recent major curricular reforms

These include:

- Increase of Koran and religious subjects in all of the school levels.
- Increase of Arabic language from first grade of the guidance cycle up to grade 12 in high school; and introduction of this subject in the technical and vocational schools. Worthy of mention is that according to the New Constitution, Arabic language is the second language for all Iranian people.
- Introduction of new extra curricular activities to complement learning of different subjects at all school levels.
- Introduction of some curriculum reforms in all subjects at different levels, especially in mathematics and socials studies.
- Introduction of defense preparation at the higher secondary level.

Teacher competencies

In general it is necessary that every teacher:

- have a good physical and spiritual health.
- be morally upright and has a good knowledge and faith in religion.
- have a good knowledge and necessary skills for teaching.
- have good knowledge and necessary skills in teaching his/her a subject.

Needs and requirements in regards to disadvantaged groups

Some needs and requirements in teacher education with particular reference to the socially, economically and culturally disadvantaged learners include:

- Supply the required elementary teachers in remote rural regions and to migrant tribes through the establishments of rural and migrant tribal teacher training centres.
- Enable the ethnic and religious minorities to have teachers from their own culture and to have their own religious studies.
- Institute curriculum reform in teacher education to enable teachers to have subject specialization and at the same the ability to handle other subjects, as in the context of rural schools they are likely to handle more than two or three subjects.

Strategies in teacher education

- Have more short in-service training courses for all the teachers.
- Have more long range in-service training courses designed to upgrade the qualifications and sustain professional growth of teachers, e.g. through distance education.
- Establishment of Islamic open university.
- Establishment of a Distance University called "Peyame-Noor" University.
- Recruitment of all required teachers in all the school levels from teacher training schools, college (centres) and universities and paying (or employing) the students to increase their incentive.
- Use of radio, television and satellite programmes for in-service education.

Lao People's Democratic Republic

Curriculum Reforms

Over the years the Lao PDR Government had placed high priority on curricular reforms particularly in the elementary and secondary school levels. However, it has been noted that as yet no remarkable curricular reform has been launched to date.

Lao has five types of teacher training programmes, e.g. pre-school teacher training; primary school teacher training, lower secondary teacher training, upper secondary teacher training and the educational caches. Each of the foregoing teacher training programmes has its own curriculum. The greater portions of the curricular offerings are directed towards laboratory work/practical work. By and large, teachers are trained in Lao in each level according to the priority need of each teacher.

Major Teacher Competencies

Even with the use of the traditional programmes in teacher training, the following competencies are still expected from the Lao teachers:

1. Teachers should have the mastery of subject matter and should be equipped with the necessary skills in pedagogy.
2. Teachers should participate actively in initiating educational reforms with the end in view of helping shape a new generation of new Lao men.
3. Teachers should continue searching for the most appropriate method of teaching and in the process uplift the competencies of teachers.
4. Teachers should work with learners with mutual respect and dignity.
5. Teachers should utilize appropriate teaching materials to ensure effective learning in the classroom.

Needs and Requirements

Among the more common needs and requirements to meet the on-going teacher education programmes are the following:

1. Train more teachers to produce qualified teachers who can provide effective instruction to Lao children.
2. Provide appropriate physical facilities like school laboratories, libraries, textbooks for learners as well as reference books for teachers.
3. Provide training to more pre-school and primary teachers to meet the need for more teachers for the growing population in Lao in the year 2000.
4. Providing incentives to Lao teachers who are assigned to teach in the remote areas.

Strategies and Materials

1. In-service training programmes should be assigned at the local teacher training institutes. Thus, centres for upgrading the competencies of teachers should be set up in every province in Lao.
2. Short-time training programmes for teachers in the pre-school, primary and lower secondary schools should be offered in the local centres.
3. Training programmes on teacher education should be made available likewise to school administrators to ensure proper implementation of any curricular reform.
4. Establish a centre for the production of instructional materials for each level of the teacher training institutions in Lao.

Malaysia

Curricular Reforms

Education in the eighties emphasized the holistic development of the individual as enunciated in the National Education Philosophy. The New Primary School Curriculum (NPSC) was introduced in 1983. It aims to help each pupil attain an overall and balanced development, in physical, spiritual, intellectual, social and moral domains. It also stresses the development of physical, affective and personality characteristics such as loyalty, patriotism, understanding and tolerance which are to be nurtured through both the curricular and co-curricular programmes.

The NPSC emphasizes the child centred instructional approach in the acquisition of basic skills of reading, writing and arithmetic and in the other subjects. New subjects, man and environment, commercial practice, moral education and manipulative skills were introduced.

The Integrated Secondary School Curriculum (ISSC) is being implemented in stages beginning in 1989. In planning the ISSC, due consideration was given to the following areas:

- integration of intellectual, spiritual, emotional and physical aspects towards a holistic development of the individual;
- continuity from the NPSC in terms of curricular content, principles, concepts and teaching learning strategies;
- general education with a common curriculum and provisions for delayed specialization;
- strong foundation for promoting life long education;

- upgrading proficiency in the usage of Bahasa Malaysia (the national language)
- emphasis on aesthetic and moral values.

A new subject, Living Skills, will replace the existing pre-vocational subjects (industrial arts, home science, commerce and entrepreneurship, and agricultural science).

Teacher Competencies

In response to the curricular changes in the school a number of new teacher competencies have to be developed. Apart from being knowledgeable about the new contents, teachers will also need to develop skills to operationalize the teaching-learning strategies recommended such as the following:

- the management of learning through variety of student groupings;
- diversity and flexibility in the selection of skills and knowledge for a particular lesson;
- meeting the individual needs and interests of students;
- utilization of available local materials and resources via resource based learning;
- teaching of values across the curriculum;

In addition to the above, there are other competencies to be developed, including:

- skills in the teaching and learning strategies in multigrade classes;
- skills to plan and manage remedial activities for the slow learners as well as enrichment activities for the above average students;
- skills in the teaching and learning strategies for children with learning disabilities/difficulties;
- development of self-reliance to prepare teachers who will be physically and mentally prepared to serve anywhere in the country (for trainee teachers only);
- skills to provide and organize co-curricular activities irrespective of the location of the school (for trainee teachers only);
- skills in basic computer education (for trainee teachers only)
- to upgrade the quality of teachers, a more stringent selection procedures has been implemented. The number of O Level passes had been increased from four to five and candidates should also have at least a pass in mathematics.

In-service Training and Professional Development

For serving trained teachers – various courses are conducted ranging from one, three and six months to a year. Some of the areas convened are: multi-grade teaching, remedial education, environmental education, special education for the handicapped, various strategies in teaching and learning of the national language, manipulative skills and living skills.

Education media service programmes also planned to stimulate interests and enhance the teaching learning process through the use of interesting instructional materials and pedagogical strategies. The services provided under this programme include educational television and radio programmes.

There are also programme aimed at upgrading and improving the academic and professional knowledge and competencies of teacher educators. Since 1987, various courses were conducted, some of this are: action research for teacher educators, collaborative and co-operative teaching in teacher education, managing change in teacher education and programme evaluation in teacher education.

College trained teachers who wish to pursue higher academic qualification to a first degree level are able to do so via the off-campus programme. The only university which provides this kind of programme is the Science University, Malaysia.

Maldives

In 1980 a Five-Year Curriculum was introduced in Maldives. All primary schools except the English medium schools in Male (the capital) were instructed to teach the new curriculum which consisted of nine subjects. Prior to this, there was no standardized curriculum.

This curriculum has undergone major revisions and reorientation. The revised curriculum and a new curriculum for the middle school (grades 6 and 7) referred to as the National Curriculum was introduced in 1984. The National Curriculum emphasizes the all-round physical, intellectual and emotional development of the individual. It also articulates the promotion of the national identity and development skills and capabilities of becoming a useful citizen in a fully Islamic society.

The National Curriculum introduces new areas of learning in order to achieve specific educational objectives. The primary curriculum includes seven subject, namely, Islamic studies (with Quran), Dhivehi language, English language, mathematics, environmental studies (E.S.), physical education and practical arts. At the middle school level the E.S. is separated into science and social studies, and Arabic language is introduced as an additional subject.

The secondary schools follow the G.C.E. O' level (London) syllabus. In addition, "Fisheries Science" which was developed locally and accepted by the London University has been recently introduced as a subject. Islamic studies and Dhivehi language are also taught at the secondary level as compulsory subjects.

In Maldives only the training of the primary teachers is being undertaken. The training for the middle school and secondary school teachers is conducted in other countries.

Reforms in primary school curriculum have necessitated the development of the following major teacher competencies:

- Be knowledgeable in the contents of all the primary school subjects.
- Be knowledgeable in the processes of the physical, intellectual and emotional development of the child.
- Demonstrate positive attitudes towards children.
- Demonstrate effective teaching in a child-centred approach.
- Be an effective organizer of interactive learning experiences.
- Develop awareness of the environment and the need for its protection.
- Be an effective organizer of learning resources with special reference to low-cost teaching aids.
- Employ methods of continuous assessment effectively.
- Develop skills of self-learning.
- Participate actively in community activities.
- Organize and conduct co-curricular activities.
- Develop skills of teaching in difficult educational contexts.

In response to the reforms in school curriculum the teacher education curriculum has accordingly been revised to reflect the changing priorities. Materials for training have to be developed. This task involves selecting appropriate materials from books and journals and translation of relevant materials from English into Dhivehi.

In the pre-service training a number of new emphasis have been introduced:

a) In addition to preparing trainees to teach regular classes, they also have to be trained to teach children in the remote areas. As teachers in remote areas have multiple roles, they also have to be trained to manage schools, deal with parents and the community and organize all kinds of school activities. An extension of the course duration may be necessary to accommodate these special needs.

b) Activity-based teaching is emphasized, hence project work, child studies, group assignments, field visits, role-play and peer-group teaching have now become regular features in teacher training.

c) Development of teaching aids has become an essential component in teacher training, and special workshops are organized to develop these

aids and a manual "How to Make and How to Use Low-Cost Teaching Aids" (This has been produced.).

d) Trainees are encouraged to participate in many co-curricular activities.

Following the school curricular reforms, a series of orientation seminars have been organized for the practising teachers. At these seminars teachers are oriented to the new textbooks and teachers' guides and provision made for exercises in planning teaching units and in developing schemes. In addition to these seminars, workshops have been organized for developing teaching aids.

Approximately 50 per cent of teachers in the atolls are untrained. For these teachers, a two-week intensive programme has been organized. There is a great need to further strengthen this programme. A comprehensive training package needs to be prepared and alternative methods/strategies need to be considered.

Myanmar

Curricular Reforms

The more recent curricular reforms in Myanmar include, among others, the inclusion of English as a subject from Kindergarten up to high-school level. Even in subjects like science, mathematics and economics, English has been used as the medium of instruction. All of these endeavour had been done to enrich the basic education programme in Myanmar.

Another curricular reform in teacher education was initiated in Myanmar through the Academy for the Development of National Groups (ADNG). The academy trains deserving youth to become primary assistant teachers. (title given to teachers in primary schools). In the academy the trainees undergo three years of academic training and one year for teacher education.

The educators in Myanmar, likewise, launched curricular reforms through distance education to train more and more teachers through the correspondence system. This programme provides training to untrained teachers who cannot attend formal training in the regular schools.

Face-to-face teaching is possible every summer term at the teacher training schools and colleges where correspondence courses are offered. The style is usually composed of the principals and the instructors in the correspondence system. In addition to the regular courses for teaching, other co-curricular activities like physical education, basic military training, drawing, painting, music, agriculture, home economics and industrial arts are offered.

Teacher Competencies

In the implementation of the aforementioned curricular reforms the following teacher competencies are needed to continue the programmes started:

Ability to:

1. communicate in English and to teach the subject as a learning area in the short-term course for primary teachers;
2. use English as the medium of instruction for science, mathematics and economics;
3. provide the youth experiences that will train them for leadership and find health habits, upgrade their standard of living through education; and have a general knowledge of the national groups;
4. extend outreach education through the correspondence schools; and
5. participate in the face-to-face teaching experiences to help upgrade the competencies of untrained teachers.

Needs and Requirements

In meeting the required teacher competencies, the following are being recommended:

1. Introduce more courses that will utilize English as the medium of instruction.
2. Provide more in-school and out-of-school teaching-learning experiences that will provide leadership in teacher education;
3. Prepare teaching materials for out-reach services to reach the teachers in the more remote areas in the region; and
4. Participate in the pre-service and in-service training programmes in teacher education.

Strategies and Materials

As a developing country in Southeast Asia, the Myanmar educators can use the following strategies and materials:

1. Preparing teachers' manuals for teachers and students in the use of English as medium of instruction in some selected learning experiences;
2. Developing a curricular offerings for each level in the development of national cultural/ethnic groups;
3. Providing more assistance both academic and economic, to the students that are being trained in the academy;
4. Inculcating in the minds of the trainees the specific roles that they have to do in the field, e.g., the provision of religious education programme; and
5. Participating in the summer in-service training programmes to uplift the competencies of teachers.

Nepal

In Nepal primary education is recognized as a basic need. Hence a target has been set in the National Development Plan to provide primary education to all the children between 6 to 10 years of age by the end of this century. Accordingly, primary schools will be established at convenient points so that there will be a school for every primary school going child within a radius of 1 kilometer in the mountains, 1.5 kilometer in the hills and 2 kilometer in the terai region. In the urban areas new schools will also be built where necessary in each ward if the enrolment in a school is over 600 but the enrolment in the new school will not be less than 200 students. By the end of this century there will be 17,713 primary schools in the country.

In view of the projected number of primary school age children for the Year 2000 the Ministry of Education and Culture (MOEC) has fixed the teacher/student ratio at 1:20 for the mountain; 1:30 for the hills and 1:40 for the terai and the town areas. There is also the need to ensure quality teaching by making it necessary for all prospective primary school level teachers to pass the School Leaving Certificate (SLC) examination as the minimum academic requirement. A basic 150 hours (first phase) teacher training programme has also become a must for every teacher. The MOEC plans to train 72,200 teachers so that by the Year 2000 there will be 88,565 trained teachers in the country.

To implement the basic education programme all primary teachers have to attend short-term courses organized by the MOEC. For this purpose, the MOEC established two coordination committees, the central level training coordination committee and the district level teachers training coordination committee. The MOEC, in cooperation with the experts from the Faculty of Education of the Tribhuvan University in Kathmandu, devised a 150 hours initial packages with special emphasis on teaching techniques for use during the courses. Three packages were produced, designed accordingly for the three distinct types of teachers at the primary level i.e.: (a) grades 1-3 teachers; (b) grades 4-5 teachers who are experienced teachers or proficiency certificate holders; and (c) English teachers with low proficiency in the language. Advance training packages will be developed and used in phases for those teachers who were already trained using the first three packages cited above.

The MOEC conducted two to three weeks' trainers training programme in all the five regions with the assistance of the Faculty of Education. District supervisors, subject specialists of Regional Education Inspector Office and PEP staff members were given training as trainers. Subsequently they organized the 150 hours training programmes in their own locality. This strategy has proved to be cost effective as indicated by the findings of the study completed last year.

The Radio Education Teachers' Training (RETT) Unit under the MOEC Training Division, also developed a 150 hours training package for training the primary teachers in selected districts. This training package which is an integrated one comprising all subjects at the primary level, is especially geared for teachers' handling grade teaching, hence, more relevant to teachers in the mountains and hilly areas. The RETT

programme also incorporates contact sessions and supervision and guidance by resource persons available locally.

In order to promote quality education a number of measures are being undertaken:

a) Teachers are graded into four categories: first, second, third and fourth: Promotion to the next higher grade is made possible according to a number of criteria like educational qualification, experience, competence and training.

b) The incentives for undergoing training of 150 hours duration include salary increment of Rupees 45 per month; and enhanced chances for promotion

c) Teachers serving in the remote districts are entitled to remote area allowances ranging from 50% to 110% of their salary.

d) Provision has been made to provide Rs.45 per trainee for constructing a set of teaching aids during the training period so that they could take them to their schools.

e) Free textbooks distribution scheme started since 1979 and will be extended to all primary school students.

f) In order to encourage schools to increase girls participation, certificates and cash prizes are awarded to schools enrolling the highest number of girls.

g) Some girls are given allowance for stipend and school uniform every year as a means of encouraging parent to send and retain their girls in schools.

h) In the present context, the curriculum is going to be revised to reflect adequately major national concerns like environment, population, nutrition, health, poverty alleviation, and democratic values.

i) The MOEC is also going to train the headmasters and supervisors in school management and supervision to raise the quality of education especially in remote and isolated areas.

Pakistan

The most recent major revision of the primary and secondary school curricula was done in 1983-86. The revised curricula ensured that difficulty level in a particular discipline gradually increases from the lower to the higher level, unnecessary and obsolete concepts were deleted to make room for new concepts and unnecessary overlapping of concepts in different disciplines of the same level were eliminated.

The new curricula emphasize the teaching of the science subjects by active involvement of the students, i.e. learning by doing. Similarly in the humanities it is

recommended that students be encouraged to learn by doing. Facilities for role playing, public speaking and other socio co-curricular activities are to be provided. Some new areas of study such as environment education, computer education, population education and social problems like drug abuse have been introduced.

Most of the schools are overcrowded and teachers are underqualified or untrained. To upgrade teachers' proficiency and to help them implement the recently revised curricula the following competencies are required of them:

- Ability to handle and manage large classes.
- Ability to teach multigrade classes.
- Be able to practice the latest teaching techniques.
- Be well versed with the subject contents to be taught to the students.

In Pakistan the education of girls is not encouraged. Children in the remote parts of the country do not have access to good schools and teaching equipment. Qualified teachers are reluctant to accept jobs in these areas. In addition, parents in these remote areas are practically illiterate, so the children are deprived of any guidance at home. They are further disadvantaged as the mass media like newspapers, radio and TV are not available.

In order to give special assistance to children in the rural areas courses for teachers expected to teach in these areas have been introduced in the teacher training institutions. Special admission policies by lowering the entry qualification for the trainee intake from the rural areas have to be formulated. Also special incentives such as higher financial allocation for rural schools have to be introduced.

To implement the revised curricula training workshops were organized at the federal level to train master teacher trainers. The participants generally comprised the working teachers of teacher training institutions. After the training they would train grassroots level teachers in their institutions. Similar workshops for classroom teachers were organized by regional extension centres.[1]

In response to the revised school curricula the pre-service programmes have been revised accordingly. These new programmes incorporate the latest teaching techniques and the new concepts. All teacher training institutions including the Allama Iqbal Open University are implementing these new programmes. Opportunities for the teachers to improve their qualification while in-service are provided and incentives like *advance increments* are given to those who improve their qualifications.

1 To overcome the shortage of sophisticated equipment special workshops for the primary level teachers are being organized to equip them with the skills of planning/designing/developing their own low cost teaching aids.

Papua New Guinea

Curriculum reforms

Primary and secondary education have long been recognized as major tools in the development of the country. The most recent reform at the *primary level* is the introduction of the Community School Based Education (CSBE) which is one of the main thrusts in the Education Plan of 1976-1980's. This reform is to ensure that children are able to lead useful lives in their communities, as only a minority of them proceed to the secondary level and higher educational levels.

Under the CSBE programme, there are nine subjects, viz., English, mathematics, science, expressive arts, community life, local literacy, health, physical education and religious education. For three of these subjects (English, mathematics and science) the curricula are nationally prescribed, i.e. common to all schools. The other subjects are community-based, i.e. specifically geared to the specific needs of each community.

The materials for the programme – the curricula, textbooks and teachers' guides – are prepared by the Ministry of Education for the community-based subject, each community is encouraged to prepare additional materials.

Secondary education is divided into two parts. The lower secondary (grades 7-10) is provided in the provincial high schools. The subjects offered are English, mathematics, science, social science, expressive arts, agriculture, commerce and home economics. The upper secondary (grades 11-12) is provided in the national high schools. The subjects offered are English, mathematics, science (biology, chemistry, physics), and social sciences (geography, history, politics, economics). The Ministry of Education prepares textbooks and teachers' guides for all these subjects. Efforts are made to continuously improve these materials, particularly for English, mathematics, and science.

Teacher competencies

The major teacher competencies that need to be develop to implement the curricular reforms are as follows:

- to undertake research activities and develop curriculum to cater to the needs of each individual student and the community;
- to manage and administer all aspects of the school and classrooms; and
- to acquire additional knowledge and skills to enable them to be up-to-date in the development of the teaching/learning processes.

Disadvantaged groups

Recently a new language and literacy section was formed in the Ministry of Education to develop language and literacy programmes for the educationally disadvantaged population groups.

In order to have qualified people to work on these programmes, the Education Department is sponsoring potential teachers to undertake language and literature studies at degree level at the University of Papua New Guinea. Upon completing the study, these teachers are required to:

- develop language and literacy curriculum for disadvantaged children;
- develop mini course packages; and
- conduct language and literacy mini courses for teachers at the district and community level.

Teacher education

All practising teachers in the primary and secondary schools have received professional training. Currently pre-service training for primary level teachers is conducted in nine teacher training colleges through a two-year certificate course (which will change to a 3 year Diploma from 1991). All trainees are trained in all the nine primary level subjects. Pre-service training for secondary level teachers is conducted by the Goroka Teachers College and the University of Papua New Guinea. Trainees have to select two subjects for specialization and a minimum of four as options.

The in-service training for primary and secondary level teachers is the responsibility of the In-service College, Goroka Teachers College and University of Papua New Guinea in consultation with Education Department. To orientate primary school level teachers and headteachers to the CSBE the following programmes are being conducted:

- Multigrade Teaching Workshop. This is one-week programme and the participants comprise two teachers from each community. These teachers would then train other teachers at the district level on an in-house basis.
- Curriculum Development Workshop. This is a one-week programme and participants would then conduct training for other teachers at the district/school level.
- Community Schools (Primary) Senior Teachers and Headteachers Course in Educational Administration, Management and Supervision and curriculum studies. This is a six-month programme and participants would then conduct in-house training for the other teachers.
- Diploma in Education Studies. This is a two-year programme in staff supervision, research and evaluation and professional development.

The in-service training for the secondary school level teachers is provided via vacation courses conducted by the Goroka Teachers College and the University of Papua New Guinea. Three courses are offered, viz:

- Subject specialization courses;
- Special courses in administration, management and supervision; and
- Advanced diploma in educational studies.

Each of these courses is of two years duration. Participants attend one session of six weeks on a full-time basis each year. In between sessions they have to undertake field assignments.

Philippines

Recent Major Curricular Reforms

Elementary Level The New Elementary School Curriculum (NESC) was introduced in 1983 through the Programme for Decentralized Educational Development (PRODED) which was fully implemented in 1989. It focuses on the development of a shared values and beliefs system which fosters a sense of humanism and Filipinism among the pupils in the elementary grades. It covers fewer learning areas. It aims at mastery learning among the pupils. The skills for mastery can be found in the Minimum Learning Competencies for each learning area.

Secondary Level The Secondary Education Development Programme (SEDP) was introduced in 1989. Its full implementation shall be in 1992. It is a response to the need to continue pupil development started by the NESC and to improve student performance in science, mathematics, and communication arts. It aims to improve the quality of secondary graduates and the internal efficiency of the system. It covers curriculum development, staff development, and physical facilities development.

The SEDP curriculum is student-centred and community centred. It offers values education as a separate subject aside from being integrated in the teaching of the other subject areas. It identified desired learning competencies in each subject area. It integrates values education, in work experiences as well as in home technology and practical arts. It emphasizes critical thinking to promote creativity and productivity at all levels.

Major Teacher Competencies

The Ministry of Education, Culture and Sports (MECS) Order No. 26, S. 1986, provides among others, the policies and standards for teacher Education (PST), and the improved Teacher Education curricula for Bachelor of Elementary Education (BEED) and Bachelor of Secondary Education (BSED) (1986-87). The order gives a clear guide as to the minimum requirements for the operation of teacher education programmes. As embodied in the order, the main concern of teacher education is the

preparation of teachers imbued with the ideals, aspirations, and traditions of Philippine life and culture and sufficiently equipped with knowledge of an effective delivery system. Specifically, teacher education programmes are expected to produce teachers who can assume the following major roles:

1. An effective conveyor of organized knowledge which has developed from human experience through the ages, such as language mathematics and natural science, history, geography, literature and the fine arts, civics, and culture;
2. An efficient promoter and facilitator of learning that will enable the learner to develop to the fullest their potentials for a continuing pursuit of self-education; and
3. A true humanist who possesses a clear understanding and appreciation of the genuine human ideas and values that elevate the human spirit, refine human nature, and contribute to the human being's unending quest for fulfillment.

Needs and Requirements

The following will help meet the needs and requirements in teacher education to prepare competent teachers:

1. Reorientation of teachers such as through i) the training programmes conducted in connection with PRODED, aimed *inter alia* at redressing disparities between and within regions in the delivery of services and allocation of resources; ii) the Private School Re-orientation Programme, which involves the development of training materials, training of trainers, training of regional trainers, and direct training of private school teachers; iii) SEDP training scheme which is a massive training programme for all the implementors of the new secondary education curriculum – from the regional directors to the classroom teachers; and iv) the Reorientation Programme for Administrators and Teacher Educators, a joint project of the Department of Education, Culture and Sports (DECS), the Fund for the Assistance to Private Education (FAPE), and the Philippine Association for Teacher Education (PAFTE).
2. Continuing education of elementary school teachers, which includes: i) the establishment of District Learning Centres, where there are Learning Action Cells which conduct meetings to thresh out common problems and undertake resource materials development; and demonstration teaching *via* television done by master teachers.
3. Revision of teacher education programme, whereby the revised BSEED and BSED curricula emphasize the mastery of basic skills and the development of humanism and Filipino values. These are designed to meet the competencies arising from the NESC and the SEDP.

4. Education for the disadvantaged groups. These include the following:

   i) Special education for the handicapped. In the public school system, there are pilot schools for the visually impaired, hearing impaired and mentally retarded in different parts of the country. Some private schools also cater to the needs of the handicapped, especially the mentally retarded.

   ii) Education for the socially, economically and culturally deprived. There is a need to attract teachers who can teach the cultural minorities in the highlands and the remote areas, particularly in Mindanao. There is also a need to prepare teachers for the urban poor, the out-of-school youth and the "street children". "Tent schools" have been put up in the highlands. Likewise "walking blackboards" are used especially with the boat people of Mindanao.

Strategies

1. Effective strategies have been developed for the handicapped and other disadvantaged groups.
2. Multi-grade classes have been set up in the far-flung places.
3. Accelerated Teacher Training Programme has been developed to meet the shortage of teachers in remote areas, especially where the ethnic cultural communities live.
4. In extreme cases where there is political instability, soldiers have been called upon to provide basic education to the children of the tribal communities.
5. Community immersion is offered in teacher education programmes by some schools where prospective teachers are given the opportunity to reach out to illiterate mothers, out-of-school youth, and street children.
6. Collaboration of private organizations and institutions with the Department of Education, Culture and Sports to improve in teacher education curricula has been established.
7. Teaching through educational media technology has become part of the teacher education curricula to promote effective learning.

Republic of Korea

The revised version of the National curriculum for Primary and Secondary Education has been in effect since 1988, but no urgent reforms in the teacher education programmes, are deemed necessary, except for integration of social studies and natural sciences for the middle school level and the requirements of elective courses (from 2 to 8 credit units) for liberal learning of philosophy, logic, psychology, education and religion for the high school level. However, recently, the Ministry of Education supports research projects for reconstructing the non-vocational high school curriculum in order to make provision for career education and opportunities for employment to those who decide not to, or fail to go on to higher education.

The National Curriculum for Secondary Education does not match up well with the infrastructure and the programmes for teacher preparation. Presently prospective teachers for the fields of natural sciences and social studies spend mostly their training period by carrying out their works requested from the department in-charged of a specific area. In science education, each prospective teacher concentrates on either of physics, chemistry, biology and earth science, almost exclusively, rather than the natural science as a whole. In social studies, each one sticks to either of history, geography and civics. But in the syllabus for middle schools, natural sciences are integrated and social studies courses are fused into a subject entitled "Study of Society". Textbooks are compiled in accord with the syllabus. Such a discordance can be found not only in the fields of natural science and social studies, but also in the vocational courses.

Recently, middle school teachers of those fields were urged to take in-service training courses one after another to familiarize themselves with the integration. But it seems to be nothing but a patch-up policy leaving the vicious phenomenon untouched.

Mentioned should be here of two activities for improving the quality of teachers in general. First the College of Education, Seoul National University developed a new idea in 1987 and put it into practice in 1988. The idea is aimed at controlling the quality of teachers from the embryonic stage of the teaching career. In the scheme the total score of the entrance examination to the college includes the quantified outcome of the face-to-face interview devised to detect potential and actual abilities for a successful teaching career. Subsequently, the Ministry of Education recommended that other institutions adopt the new system. Secondly, a study group activity has been undertaken among the faculty members, in collaboration with the Educational Research Institute, Seoul National University, for developmental studies on the subject matter, education as a discipline intended to enhance the status of the teaching profession.

No special consideration has been given to educationally disadvantaged groups in teacher education. Among those groups, the governmental policy is concerned mainly with the disabled-mentally and physically. However they are being taken cared of by special institutions other than general teacher education institutions. Meanwhile, the National Council of Educational Reform initiated the development of a comprehensive education welfare policy including food and nutrition of pupils from

poor families, minimizing of local differences in educational quality, attachment of special education classes to ordinary schools, and the provision of teachers for those purposes.

The Korean Correspondence and Air College is a unique scheme for distance education which provide in-service opportunities mostly to primary school teachers. They are enthusiastic to complete higher education at either junior or senior college level. However, the initial attraction power gradually faded drastically reducing the number of those pursuing professional growth via distance education. Now, more teachers prefer to pursue graduate studies in universities than ever before. Quite a few universities opened, or are highly inclined to open, seasonal (winter and/or summer) terms for graduate degrees, taking the teachers as target groups.

Western Samoa

Curriculum Reform

A number of curricular reforms in the different levels of the educational system was launched in Western Samoa in the early eighties. The thrust of the curricular reforms was focused on how learners could be given the opportunity to understand the environment and the society where they live. By and large, the thrust facilitated the thematic approach with the use of vernacular in teaching science, social studies, mathematics, sports, music, arts and crafts, reading and writing. Later in the early part of 1990, English as a subject was included in the curriculum which facilitated the use of strategies like the *oral approach* and *shared reading* both in Samoan and English.

Another endeavour was done in the field of education in 1985 when the curriculum writers developed curricular materials for the *multiple classes.* However, due to certain financial constraints, the production of curricular materials was stopped, but was later revised in 1990.

In the middle to upper primary level an attempt was made in localizing the English curriculum.

In the Junior Secondary schools curriculum materials were developed in Home Economics, Industrial Arts and Agricultural Science in an endeavour to assist in the development at long-term goals for those pupils who may not have the ability to go further in their education.

The school administrators organized training programmes to upgrade the competencies of teachers teaching on the primary and secondary school levels. Foremost of the emphases in the training programmes is to give training to teachers in teaching two or more courses as special subjects. Likewise, teachers are made to participate in the teaching practicum both in the academic and cultural learning activities that are structured for each grade/year level.

Teacher Competencies

To meet the foregoing curricular reforms in Western Samoa, the following teacher competencies have to be developed among the teachers:

Ability to:

1. use English and Samoan as medium of instruction in the primary and secondary schools;
2. prepare teaching materials in the different subject areas in each level of instruction both in English and in Samoan;
3. produce teaching materials for the multiple classes;
4. teach two or more subject areas equipped with the necessary competencies toward effective instruction; and
5. help in the all-out implementation of compulsory education in the country;

Needs and Requirement

In the total implementation of the curricular reforms the following needs and requirements have to be met:

1. Participation in in-service training programmes like cell group meetings either at the school level or district level.
2. Establishing centres in the productive of teaching materials in the different subject areas.
3. Establishing centres for multiple classes in the different districts/regions within a given country.
4. Sending teachers to certain teacher training institutions outside of Samoa where they can pursue courses in education to improve their teaching competencies;
5. Working closely with the law enforcers in the all-out implementation of compulsory education in every community.

Strategies and Materials

1. Subject the teaching materials produced to a try-out with the intent of refining and revising them to improve instruction;
2. With the use of different methodologies in teaching, prepare a number of teaching exemplars for the different subject areas which can be utilized in the classroom;

3. Organize more multigrade classes where teachers could utilize appropriate materials in meeting the needs of the learners;
4. Provide the teachers a number of educational experiences that will enable them to teach two or more subjects in one grade level or in a multi-grade classes.

Sri Lanka

Curricular Reforms

With increasing accessibility of school education to the general populace of Sri Lanka, the school's major concern is the preparation of children for life in society. In line with the acceptance of the principle of universalization of education the school curriculum and the facilities for education have been evolving in the direction of providing equal opportunities for education to all children in the country.

In the sixties and seventies, certain goals of education emerged in response to a variety of factors such as the knowledge explosion, rapid advances in technology, fears about a moral crisis and the desire to retain a national identity.

By now, success has been achieved with regard to the introduction of a common curriculum for the compulsory phase of education i.e. the first 11 years of schooling, in all schools and the introduction of content related to daily life, national traditions, social transactions, modern technologies and the environment. However, observations of the curriculum in practice reveal that, major deficiencies remain with regard to:

- relating school learning to real-life so as to make children 'feel' the relevance of learning;
- making learning a pleasurable activity to the learners;
- providing for adequate levels of achievement by all learners; and
- developing values in the learners to ensure that they actually use their knowledge and skills in appropriate situations.

While existing problems remain to be resolved, a new dimension has been added, i.e., the realization that the human species may not survive unless mankind learns to establish a better relationship with the environment. Therefore, every individual will have to be equipped with the appropriate knowledge and value systems.

The curriculum reforms being currently planned in Sri Lanka are directed towards better sampling of content and the use of more appropriate methodologies to increase the relevance of learning, with major emphasis on the development of values. This curriculum revision will cover the entire school span of 13 years i.e. 5 + 6 + 2.

The curriculum revision is to be backed by studies on the entry competencies of children at the various school levels. These studies are expected to provide insights into the learning problems faced by children, especially those from the less advantaged backgrounds.

Teacher competencies

The major competencies demanded of teachers by the above curriculum reforms are the following:

- accommodate the individual variabilities of learners in the teaching process;
- relate learning to real-life situations, including coping and managing change;
- develop learning activities to incorporate the affective domain
- make learning a 'real pleasure' to learners;
- use the whole range of available resources for learning;
- optimize the impact of the free facilities provided to children including the mid-day meal, health services, textbooks and scholarship grants; and
- use a wide range of evaluation procedures to support learning.

Strategies for Training Teachers

In Sri Lanka teachers are recruited either through Colleges of Education where a three year pre-service course is available or through direct appointment from those who have qualified in G.C.E. (ordinary level); G.C.E. (advance level) or University Bachelor's Degree. Those who graduate from the colleges of education with a diploma in teaching are considered professionally trained. Those who are recruited direct have to get professional training in order to qualify as trained teachers. The graduates have to pass a post-graduate diploma in education and the non-graduates have to secure a trained teachers' certificate from a Teachers Training College or any other teacher training institution.

Pre-service Training

Pre-service training is handled by the seven colleges of education. The three year course comprises two years at the college and the third year as internship in schools and will lead to diploma in teaching. This certificate guarantees a teaching appointment in a government school as a full-fledged trained teacher.

In-service Training

The non-graduate practicing teachers are professionally trained in the teachers' colleges. This course is of two year duration and about 3,500 teachers are trained annually.

The Ministry of Education through the National Institute of Education (NIE) gives professional training to about 1000 practicing non-graduate English teachers annually through weekend and vacation courses conducted on a regional basis. This course is popularly known as PRINSETT Programme.

In addition, about 5000-6000 non-graduate practicing teachers are professionally trained through the distance mode. This programme is basically a correspondence-cum-contact programme and is fast becoming popular. At present two courses are offered: (a) Elementary teachers' course with 105 modules and (b) Science/Mathematics course with 122 modules.

The Universities of Colombo, Peradeniya, Jaffna and the Open University provide training to the professionally untrained graduate teachers. The NIE also runs a course leading to a diploma by distance method through a network of regional centres.

However, at the present rate of training for the graduates and non-graduates, it will take nearly a decade to enable all the professionally untrained teachers to qualify as trained teachers. This big backlog of professionally untrained teachers in the system is a serious problem. High priority is given to eliminate this backlog within the shortest possible time. With this objective in view, the Ministry of Education has embarked on an accelerated four pronged training strategy in order to clear the backlog in 2-3 years. The strategy comprises the following:

- to train 35,000 teachers through the distance training technique, an area based three year programme, to be conducted by the Institute of Distance Education (NIE).
- to train 15,000 non-graduate teachers through a school-based programme. The head teacher and senior teachers of the school will conduct the training using distance learning modules. This is a two-year programme managed by the teachers college branch in the Ministry of Education.
- to train 10,000 English teachers via a school-cum-area based programme to be managed by the Institute of English in the NIE.
- to train all the professionally untrained graduate teachers in the system through the Diploma in Education courses in the universities and the Institute of Teacher Education in the NIE by means of expanding facilities to accommodate a larger enrolment for both the full-time and part-time courses.

Thailand

Curriculum Reforms

In 1978 there was a major education reform in Thailand which put emphasis on "education for life and society". Students are to become the centre of teaching-learning activities. These activities are to enable them to think rationally, to do things in the accepted manner, to solve problems, to seek additional knowledge and to apply such knowledge to daily life situations. The innovations involved in the reform included integration in the social studies, emphasis on process skills in science, the introduction of modern mathematics and the use of the functional/communicative approach instead of the grammatical approach in language teaching.

The implementation of this reform, with respect to the management of teaching-learning activities, could be said to have achieved a certain degree of success. But there are also instances of failure in a number of schools due to factors such as inadequate understanding of the curricula on the part of some teachers, negative attitudes of some teachers towards the reform and the heavy teachers' workload. All these have led to the need to revise these curricula.

The curricula has been revised on the basis of the following principles:

1. to strive towards education for life useful to the society, emphasizing self-development at the primary school level, occupational development at the lower secondary school level, and social and community development at the upper secondary school level;
2. to encourage teachers to emphasize process skills rather than content-oriented teaching so as to assist learners to develop analytical and rational abilities, and to solve problems systematically in order to enable them to cope with the fast changing society;
3. to allow the localities more opportunities to develop curricula for the elective subjects (both compulsory electives and free electives) so that education might be more relevant to real life;
4. to let learners study in accordance with their own aptitudes, capabilities and interests.

The revised curricula are to be used in about 550 schools under the Curriculum Implementation Co-development Project in the academic year 1990, and from the academic year 1991 onwards these curricula would be enforced in all the primary and secondary schools throughout the country.

Teacher Competencies

As a result of the current curricula reforms, teachers are required to possess competencies with regard to:

1. Curriculum and curriculum development:
   - goals, aims and objectives of the new curriculum;
   - organization of the teaching and learning environment as recommended by the new curriculum; and
   - preparation of lesson plans.
2. Content related to local situation and needs:
   - selection of content relevant to pupil's needs and daily life.
3. Teaching-learning style:
   - various methods and techniques appropriate for the learner-centred approach;
   - methods to encourage students to think critically, to analyze and to undertake independent study; and
   - the new role of the teacher.
4. Production and utilization of resources:
   - preparation of materials for each lesson;
   - production and utilization of low-cost teaching-learning materials; and
   - utilization of all kinds of resources.
5. Production and utilization of evaluation materials:
   - understanding the purpose of evaluation; and
   - construction of appropriate evaluation materials, particularly for the non-cognitive aspects.
6. Implementing innovation:
   - need to be aware of changes in all aspects of education; and
   - teachers' role as a catalyst in bringing innovation from outside to the school/classroom.
7. Teacher characteristics/behaviours:
   - willingness to devote time and energy for pupils;
   - dedication to the tasks assigned;

- need to exhibit characteristics such as responsibility, creativity, punctuality, discipline and dedication so that he (teacher) becomes a model to students and parents; and
- need to demonstrate good human relationship and to be kind and fair to to all students.

Strategies for Training Teachers

The major avenues for developing teacher competencies are through pre-service training, in-service training, and education service centres for teachers:

a) Improved pre-service training requires the revision of the existing training and curricula to increase relevance of the subject matter and to enhance teacher abilities;

b) Provision of continuous in-service programme to assist teachers to identify teaching-learning problems themselves and train them to search for solutions; and

c) Provision of education service centres to assist teachers to be up-to-date with developments in teaching-learning practices. Resources and different kinds of activities are provided at these centres for professional growth and to raise teachers' competencies.

Viet Nam

I. Curricular Reforms

Cognizant of the country's need for socio-economic development, Vietnamese educators started a nation-wide educational reform both on the primary and secondary school levels. This is spelled out in the 12-year national educational system of Viet Nam. With the foregoing in mind, our country finally came out with the structure below in our educational system:

Primary school	-	5 years
Junior secondary school	-	4 years
Senior secondary school	-	3 years.

As a curricular reform, certain changes had been introduced in the curriculum in the primary schools which included, among others, the inclusion of the following:

- music, drawing and gymnastics;
- nature observation; and
- Vietnamese language, particularly grammar.

In like manner, the secondary school curriculum has been enriched with the inclusion of the following:

- computer education;
- environment and population education;
- enriched content in mathematics'
- foreign language (from first year to seventh year); and
- vocational education designed to meet local needs.

Major Teacher Competencies

To implement the foregoing educational reforms, the following teacher competencies were developed in the process:

1. ability to teach subjects like mathematics, physics, chemistry, literature, geography and history;
2. ability to teach English and other foreign languages; and
3. ability to teach practical arts and to utilize highly scientific research equipments in the classroom.

Needs and Requirements

To meet the requirements of the aforementioned curriculum reforms in Viet Nam, there is a need for school administrators to:

1. hire teachers with the necessary competencies in teaching foreign languages, music and gymnastics;
2. employ teachers with the necessary competencies in teaching multigrade classes particularly in the remote areas in the country;
3. improve the quality of training programmes for the training and retraining of teachers in the different subject areas; and
4. provide certain incentives to education students to keep them in the teaching profession.

Strategies and Materials

To ensure the success of the educational reforms, the following strategies have been identified by the Vietnamese educators in the process:

1. Re-directing the training programmes toward employment; that is, raising the efficiency of learners for employment.
2. Training programmes that are flexible and diversified should be provided to develop competencies in the teaching of literature, mathematics and foreign languages to our students.
3. Sharing one's experiences in the teaching process particularly, in teaching music, drawing, gymnastics and the like.
4. Sponsoring contests in the different subject areas in the primary and secondary schools.
5. Providing national training programmes for teachers in all subject areas.
6. Establishing more and more pilot centres for the mass retraining of teachers.
7. Providing laboratory equipments, textbooks and other teaching-learning materials for the use of the learners in the different districts in the country.

Recent Innovations in Teacher Education

In the course of the presentation of country reports many new ideas, practices and innovations were identified. As a common frame of reference the Meeting agreed to define educational innovation as being an idea or practice new to a specific educational context that meets unsatisfied needs. It is the promotion of new ideas and methods that are devised in education and/or school practices which have a substantial effect on changing existing patterns of behaviour of the group or groups involved. It is to be noted however that what is regarded as an innovation in one country may not necessarily be considered as an innovation in other countries. Bearing this in mind, each of the participants was requested to write what they considered to be important innovations in teacher education in their own country with regard to:

- the responsiveness of teacher education to curricular reforms,
- reaching out to the educationally disadvantaged population groups, and
- upgrading the qualifications and sustaining the professional growth of teachers.

In addition, each participant stated in writing what they considered to be important innovations in teacher education presented by other participants in the Meeting with regards to:

- the responsiveness of teacher education to curricular reforms,
- reaching out to the educationally disadvantaged population groups, and
- upgrading qualifications and sustaining professional growth of teachers.

About 40 ideas and practices were listed. The Meeting then split into three working groups to discuss each idea/practice and to consolidate, categorize and prioritize the different innovations. In so doing each Group used the following *criteria/indicators* of what constitute an innovation.

1) It introduces a new or novel element which deviates from existing structures and/or procedures and is oriented towards the values of the society.

2) Its specific objective and/or purpose is relevant to the needs of the community and related to national development.

3) It has potential for diffusion on a large scale and is renewable from time to time based on appropriate feedback and the context for adoption and adaptation.

4) The innovative process should involve a scientific approach before being either accepted or discarded.

5) During the experimental stage, an innovation should permit flexibility on the basis of monitoring and evaluation.

6) It should be both cost and time effective, and communicable to and able to be implemented in other parallel situations. Reliability, with or without adaptation, should be a criterion for innovativeness.

To facilitate the work of each Group, the form given below was developed, distributed and used in the analysis of each suggested innovation.

Priority	Innovation in T.E.	Criteria						Explanation
		1	2	3	4	5	6	

Group A – Responsiveness of Teacher Education to Curricular Reforms

The Group thoroughly discussed fourteen supposedly new ideas which had been previously identified by participants at the Meeting. Members categorized these ideas into four main clusters in the order of priority, namely i) alternative innovative modalities for in-service training of teachers to develop competencies required of teachers; ii) teacher education related curriculum renovations, iii) pre-service teacher training-related innovations, and iv) decentralization-related innovations. Each cluster is briefly discussed below:

In-service training of teachers.

Facilities for pre-service and in-service teacher training institutions are not sufficient to develop competencies for effective implementation of new school curricula. Therefore, alternative methods have been evolved. For example, a few master teacher trainers at the federal level are trained and they then go back to their community where they train a large number of teachers at the grassroots level. Similarly, the idea of Mobile Workshops has gained popularity. Under this programme, two or three competent teachers go to remote parts of the country and organize training programmes for the local teachers. This programme is quite cost-effective.

Teacher education-related curriculum reforms.

The competencies required of teachers, especially at the primary school level, include an ability: to handle large classes and multigrade classes; to shift to student-centred learning; to use behavioural objectives and criterion referenced evaluation; to be familiar with problem solving and valuing; to be proficient at mastery learning; and the ability to teach integrated school disciplines, e.g. integrated science, social studies, etc. To develop such competencies appropriate renovations of the teacher education

curricula at the pre-service as well as the in-service have been undertaken in most countries of the region.

India's experience illustrates appropriate restructuring of teacher education to respond to changes in education policy and curricular reforms of. Soon after the adoption of the National Policy of Education (1986), the renewal of teacher education curriculum was initiated at the national level. A revised document "National Curriculum for Teacher Education – A Framework" was brought out in 1988. The framework visualizes a teacher education programme aimed at the development of teachers as agents of change. Teacher education programmes have been conceived as the most crucial input for improving the quality of school education.

The major components of the pre-service programmes are (a) foundation courses which provide theoretical insights in education system and an understanding of processes of the human development and learning; (b) stage relevant courses, which highlight the specific features and scope of education of a given stage and also subject specific learning; (c) additional specialization in special areas; and (d) school field experience, which aims at the development of professional competencies related to the different functions of a teacher.

Pre-service-related innovation.

Besides renovating the teacher education curriculum, efforts have also been made to upgrade and update the professional competence of teacher educators. In many countries, teacher educators have been involved not only in the reform of the school curriculum, but are also undertaking extension education in the schools, including the remote rural areas, as well as schools in slum communities. In many countries attempts have been done to bring them down from their proverbial ivory tower.

Decentralization-related innovations.

This is done to enable different teacher training institutions at the sub-national levels to modify their curriculum to meet the needs of the communities which they serve. Of particular note is also the active involvement of the community in re-designing and implementation of the training programmes.

Group B – Reaching Out to the Educationally Disadvantaged Population Groups

The Group thoroughly discussed 13 ideas and practices listed by the participants at the Meeting. Those which the Group considers as priority innovations are briefly discussed on the following page:

Recruitment of teachers from disadvantage population groups.

Some countries have adopted innovative strategies designed to recruit and train teachers from among the educationally disadvantaged population groups. They have found this strategy quite effective and successful. Some examples of this are briefly described below:

Accelerated Teacher Training Programme for cultural minorities (e.g. Philippines). There is a serious shortage of qualified teachers in the remote areas where tribal communities are found. In order to make qualified primary school teachers available for these remote cultural communities, the accelerated training of teachers for cultural communities has been developed. The programme prepares the teacher not only to teach but also to serve as a leader in the community. Trainees for the programme are recruited from the communities concerned or where there are no teachers. The regular education course of four years has been shortened to two years (plus three summer schools) to satisfy the immediate needs and to allow the employment of the teacher at the beginning of each school year. Commitment of the graduates to teach in their own cultural communities and a reduction of the financial cost of teacher education for these communities were achieved through the programme.

Academy for the Development of National Groups (e.g. Myanmar). The Academy for the Development of National Groups has been established as an institution for the promotion of national unity and integrity and the training of youth as primary school teachers as well as community leaders in the remote and disadvantaged areas. The trainees are selected by a Selection Board. They are trained for three years through wide-ranging academic, vocational and professional courses and one year for teacher education. Some of the special subjects taken are basic military training, language and literature of five major races other than the trainee's own native language, the culture of six major ethnic groups, first aid and basic training on general and indigenous medicine, veterinary science, and basic course in fire-fighting. For co-curricular subjects, agriculture, physical education, fine arts, music and dancing and home economics for girls and industrial arts for boys are offered. A primary teachership training with practice teaching in the primary schools is required in the fourth year of their studies.

Rural teacher training centre (e.g. Iran). Rural teacher training centres have been established to supply the teachers required for rural areas. The students who are selected from rural guidance school graduates are given diploma/certificate and allowed to teach in rural primary schools after completing a four year course. While teaching in the rural schools, the teacher can undertake a correspondence course in order to upgrade their qualifications to post-diploma certificate. The courses in the centres offered in the first two years are almost similar to the courses offered in the general secondary schools. Courses in teaching methods, educational psychology, classroom management and other professional courses are offered in the last two years. In addition, female teacher students are given courses in housekeeping and child-rearing while male students are given courses in agriculture and animal husbandry.

Sending on-site teacher educators to atolls to conduct in-service education programmes (e.g. Maldives). Some countries made up of many islands have adopted a programme of sending teacher educators to the remote atolls to train untrained teachers and provide further training to trained teachers. Under this programme a teacher education from the Institute for Teacher Education travels to an atoll school and spends about half the academic year conducting various in-service activities. In addition to workings and seminars, demonstration lessons are also taken by the teacher educator.

Training of teachers to provide comprehensive access to primary education (CAPE) (e.g. India). Comprehensive access to primary education (CAPE) project is an alternative approach to education for out-of-school children under the non-formal education programme learning materials in the form of self-paced learning episodes and modules are developed. The modules aimed at developing minimum levels of learning comparable to those in formal education are in language, mathematics, and environmental studies. The package also consists of a question bank in different subject areas. The instructor acts as facilitator using a training manual to help the children use the self-learning materials effectively allowing him to proceed at his own rate.

Training of Teachers in Multigrade Teaching

In an attempt to reach out to the most educationally disadvantaged populations in the teaching workforce, a national field-based in-service programme has been adopted to help develop competencies of teachers in multigrade training, facilitators and co-facilitators being trained to enable them to undertake inter-school in-service programmes. Those trained on the inter-school in-service programmes then, in turn, conduct in-school in-service programmes.

Recruitment of female teachers

In some countries, e.g. Bangladesh, it was found that parents feel most comfortable when their children are under the care of female teachers. However, these countries experience difficulty in recruiting female teachers. One country relaxed its entry requirements in primary training institutes for girls interested to join the teaching profession. Besides providing free education to girls up to class 8, it requires less years of study for girls.

Provision for monetary and promotion incentives for teachers in rural areas

In most instances, teachers recruited for the remote districts are under qualified. To remedy the situation, incentives have been offered to attract qualified teachers to go to the far-flung areas. Incentives come either in the form of monetary consideration ranging from 50 to 110 per cent of the regular salary, accelerated promotion, or both (e.g. Nepal).

Group C – Upgrading Qualifications and Sustaining Professional Growth of Teachers

The Group examined the different modes used by Member States in the region in upgrading qualifications and sustaining professional growth of teachers. These were categorized into three modes (i) distance education;(ii) open university; and (iii) school-based. Each of these are briefly described on the following page.

Distance education mode.

Important innovations include the (i) Radio Teacher Training Programme, e.g. Nepal; (ii) Distance Education to Teach English Teachers, e.g. Sri Lanka; and (iii) Institute of Distance Education, e.g. Sri Lanka. Also cited in this category is the China Television Normal College, which has the potential to serve huge numbers of teachers throughout the country.

Open university mode.

Among the open university systems cited for offering degree programmes to upgrade the qualifications of teachers to a first degree and/or master degree programme; and to sustain professional growth of teachers are: (i) the Indira Gandhi Open University; (ii) the Allama Iqbal Open University, (iii) the Universitas Terbuka (Indonesia); (iv) the University of South Pacific; and (v) the China T.V. Open University; and (vi) Sukhothai Thamathirat Open University and Ramkamhaeng University of Thailand.

School-based mode.

In some countries there are school-based in-service training programmes. In many such cases, the principal/head of the school assumes the responsibility of being a professional leader, instead of merely being the school's administrative head. In other instances, those teachers who were trained at the national/federal level or provincial/state level assume the role of trainers of their peers at the school level. In a few countries, teacher educators, especially those supervising student teachers organize school-based in-service training programmes. Yet in one country, the student teachers doing practice teaching are able to introduce innovative ideas and practices to the teachers of schools in remote areas.

Major Problems and Issues

Briefly discussed below are some of the major problems and issues in teacher education which emerged from the discussions of the country reports of the participating countries of Asia and the Pacific.

Education of the Disadvantaged

It was strongly felt that the teachers must acquire competencies to deal with specific problems related to this 'concern' which is a common and urgent problem area in most of the countries of Asia and the Pacific region. The main problems are – reaching the children through convincing the community of the significance of education; relating school curricula to their needs; developing teaching/learning materials related to the needs/environment of the educationally disadvantaged groups; communicating in the local language/dialect; and planning strategies and teaching/learning activities to help each learner attain defined/essential levels of learning.

Developing Teacher Education Curricula

Following on from the previous point, this raises the issue as to the content of the curriculum in teacher education, and who should determine this. In some countries decision-making about the content is centralized and then largely imposed upon teacher education establishments, while in others a core curriculum is developed centrally and then the individual teacher education establishments determine the remainder of the curriculum for themselves in order that they can be responsive to the particular background characteristics of recruits, and to the needs of the learners-student teachers are likely to encounter on graduation.

Teachers in Difficult Context

In many countries, it has been very difficult to have enough teachers in schools in difficult context (e.g. remote rural areas, mountainous regions and isolated island communities), and where ethnic cultural minority groups live. In some countries, attempts are being made to attract promising young people from these ethnic communities with varying degrees of success.

Many young people from remote rural areas who opt for the teaching profession tend to be co-opted by the conveniences of city/urban life and wind up teaching in elite schools rather than returning as teachers in the villages where they come from.

Upgrading the Qualifications of Teachers

Upgrading the quality of teachers and sustaining professional growth through pre-service and in-service training programmes is also a common problem of most of the participating countries. The main problems are – restructuring the teacher education curriculum to suit the curricular changes in the school system; providing facilities for continuing in-service education through establishing suitable infrastructure; developing materials and strategies for self-improvement of teachers (training packages, mass media programmes, video films, etc.); planning programmes for the education, especially of untrained teachers; and sustaining the professional growth of teachers. Teachers professional development should be viewed as being a "career-long" process.

Senior Staff Development

When discussing teacher education at the in-service level the emphasis tends to be upon the professional development, and the upgrading of the knowledge and skills, of classroom teachers. But there are other educational personnel at the school level who are also in need of career-long professional development: the principals, vice-principals and other senior staff all of whom are influential "managers" in setting the organizational tone or climate in a particular school, and in establishing the boundaries within which teachers operate. Thus if teacher education establishments are to be truly effective in developing the new competencies required of teachers to implement curricula reforms, professional development programmes should also be developed for senior staff and administrators as well as the classroom teachers.

Status of Teachers

The participants of the Meeting agree with the Director of UNESCO PROAP that no nation can rise above the level of its teachers. However, in many countries, no geniuine effort is being exerted to enhance the status of teachers. The major problems are related to raising the economic and social status of teachers. Teachers salaries continue to be very low, and in general the working conditions are far from satisfactory. The situation is aggravated by the fact that promising young people are shunning the teaching profession in favour of the more glamorous careers, like medicine, engineering and business. In order to raise the status of teachers especially in elementary and secondary schools and teacher educators in the teacher training institutions salaries should be sufficiently high that there is no need to earn extra money outside teaching.

Research in Teacher Education

Concerns were raised that Teacher Education appears to thrive more on "encyclopedia of mythologies" rather than "encyclopedia of knowledge", largely because teacher educators are hardly doing research. In many countries, those engaged in basic research get most of the research funds, those doing applied research receive some funds, and those undertaking action research get no funds at all. While there is a general recognition on the need to encourage teachers to do action research, in many countries there is no effective scheme to motivate teachers to do so. Research remains the weakest component of teacher education programmes of all the participating countries.

There is an urgent need to undertake action research to

(i) identify the needs of school education aimed at making teacher education programme relevant;

(ii) develop relevant contents and processes for teacher education;

(iii) assess the impact of different modes and strategies of teacher education at the pre-service and in-service levels, including distance education;

(iv) determine specific competencies needed to deal with problem areas of school education (education of the disadvantaged, unenrolled and dropouts, disabled; educational and vocational guidance);

(v) develop local-based low-cost teaching/learning material; and

(vi) develop innovative teaching/learning strategies, and materials.

Coping with Change

It has been pointed out that changes in society (due to advancementsin science, technology and industralization) and subsequently in the educational systems and its curricula are quite rapid that before the competencies required of curricular reforms are developed by most of the teachers, new curricular reforms with new sets of competencies required of teachers emerge.

Education has traditionally been reactionary: that is, more concerned with transmitting culture than with creating new culture. Curricular changes are made in response to technological and socio-economic changes and teacher education tends to respond to curricular changes, rather than anticipating changes in school curricula and the education system. That is teacher education tends to be re-active rather than pro-active.

If this situation is to be changed, there needs to be a closer working relationship between curriculum developers and teacher educators. Perhaps, for instance, the two processes (curriculum development and teacher education) may be integrated through such strategies as:

(i) setting up co-ordinating committees with representatives from curriculum developers, teacher educators and textbook writers, and perhaps practicing teachers, teacher trainees, and each senior school students; and

(ii) regular exchanges of materials between curriculum developers and teacher educators to indicate the latest developments in their thinking and research.

Chapter Three

TOWARDS DEVELOPING NEW TEACHER COMPETENCIES IN RESPONSE TO MEGA-TRENDS IN CURRICULUM REFORMS

This Chapter presents an overview of the major considerations involved with development of new teacher competencies, through teacher education, to accommodate maga-trends in curricula reforms at the school level. It is largely based upon the Working Document prepared for the Study Group Meeting by the Technical Working Group.

The framework for discussion, and conceptual framework, presented in this Chapter were adopted by participants at the Meeting as an appropriate way to proceed.

In the next two chapters illustrative examples and teaching/learning materials are presented, which take up and extend the material in this Chapter. Chapter Four examines illustrative examples and materials for the natural sciences and mathematics and Chapter Five presents those relating the social sciences and languages.

I. Introduction

A. Background:

In the light of APEID's Work Plan for the Fourth Programming Cycle (1987-1991), numerous APEID sponsored regional and national study group meetings on teacher education, and the recently published two volume report on *Innovations and Initiatives in Teacher Education in Asia and the Pacific Region: A Comparative Study* (UNESCO, 1990), several important themes can be identified which relate to how teacher education can best serve, and be responsive to, the diverse and changing needs of population groups attending schools in member states in Asia and the Pacific region.

Three themes can be singled out as deserving special mention at the current time. These relate to a central concern about what can be done by APEID to help enable teacher education contribute to the betterment and reform of school systems in member countries. These key themes are discussed below and elsewhere in this Chapter.

(1) **Responsiveness of teacher education to changes in the school curriculum:** There has over the past decade been tremendous social, political and technological change in Asia and the Pacific region. Accord-

ingly, many countries have revised or are currently revising their school curriculum. It is essential that the systems of teacher education in member countries are sufficiently responsive to changes in the content of the school curriculum, and to the teaching-learning methodologies and materials used in schools, that teachers are adequately prepared to implement such changes at the school level. There is therefore a need to assess the extent to which systems of teacher education have been responsive to these changes in the school curriculum with regard to the preparation of teachers, with special emphasis on developing the *new competencies required of teachers* in the context of curriculum reforms.

(2) **Training teachers who are able to assist disadvantaged students:** Increasing attention is being given throughout Asia and the Pacific region to a consideration of the extent to which the systems of teacher education in member countries are adequately equipping teachers to cater for the often *special needs of educationally disadvantaged population groups.*

(3) **Improved professional development, through teacher education, with particular reference to the contribution of distance education:** If the issues referred to under points 1 and 2 above are to be successfully accommodated it is essential that professional support services at the pre- and in-service levels of teacher education adequately equip teachers to deal with these matters. In view of the large numbers of teachers already working in schools, many of whom are under-qualified, and all of whom require career long professional development, *distance education* has a particularly important part to play in providing the means by which teachers' knowledge and competencies can be upgraded.

B. Operational definition of key terms:

In order to ensure that a consensus occurred regarding the terminology used at the Meeting, and that the use of terms was consistent with that adopted in other APEID activities, certain key terms of central importance to an examination of curriculum reform, and the implication for teacher education in Asia and the Pacific, were defined as follows:

Educational change refers to any noticeable move from established practice; it may be large or small, lengthy or brief.

Educational innovation refers to an idea or practice new to a specific educational contexts that meets unsatisfied needs. It is the introduction or promotion of new ideas and methods that are devised in education and/or school practices which have a substantial effect on changing the existing patterns of behaviour of the group or groups involved. Innovative strategies imply the developing of new ideas which are disseminated and utilized, these usually occurring in response to particular problems that exist in the education systems of member countries.

Educational (e.g. curriculum) reform refers to a planned change brought into widespread use for the betterment of an education system. It is an innovation that is in widespread use throughout a particular education system.

Teacher education refers to both pre-service and in-service programmes which adopt both formal and/or non-formal approaches. Ideally it is a continuing process which focuses on the career long professional development of teachers.

Educationally disadvantaged learners are those who suffer some handicap in the school system due to their socio-economic and/or cultural/ethnic characteristics. In the discussions, this term will be refers more to the socio-economically and culturally disadvantaged population groups, although it should be recognized that there are other population groups in school systems, such as the intellectually and physically handicapped, and gifted learners, who are also in some ways disadvantaged. In addition, our emphasis will be on disadvantaged learners rather than disadvantaged teachers.

It should also be remembered that being one of the so-called "disadvantaged" learners should not only be seen to have negative implications since many of the learners so labeled have characteristics (and strengths) which teachers can capitalize upon in a positive way.

Educational research refers to a process whereby information is gathered and analyzed in a rigorous and systematic way with regard to certain key aspects of the content and processes of education and schooling. A distinction should be drawn between educational research which provides evidence that results in changes to the *systems of teacher education* and that which occurs *within teacher education* to monitor, for example, the success and effectiveness of changes to the training programmes offered.

The distinction between teacher "competency" and teacher "proficiency" is that competency refers to what is required of teachers for them to be effective in the school and classroom, while proficiency refers to the extent to which they actually possess these abilities and are able to effectively implement the specific knowledge and skills required.

II. Conceptual framework: A process model of the accommodation of teacher education to curricular reforms in the school system

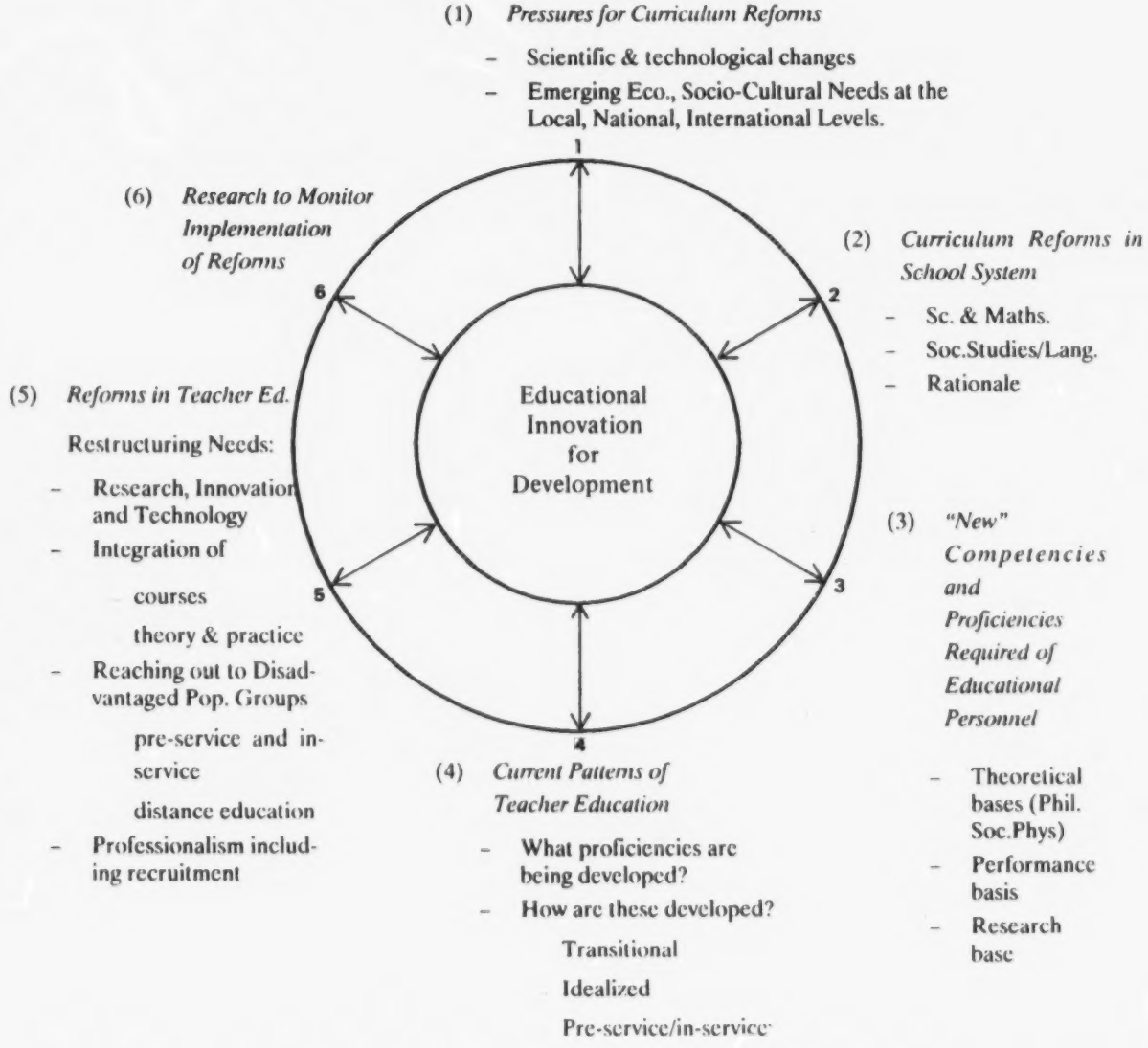
A. Introduction:

In order to help structure the discussion of the three themes to be examined at the Study Group Meeting, and the adoption of a holistic approach to teacher education, the development of an appropriate conceptual framework was seen as essential. This assisted in organizing the discussion of teacher education at the Meeting.

The following process model was adopted by participants.

B. The model: (Please see attachment)

Process Model of the Accommodation of Teacher Education to Mego-Trends Curriculum Reform* in the School System



*** Current Reform at the School Level** refers to a planned change in what is taught that is brought into widespread use for the betterment of an education system. It is an innovation (that is an idea or new practice to a specific educational context that meets unsatisfied needs) that is in widespread use throughout a particular school system.

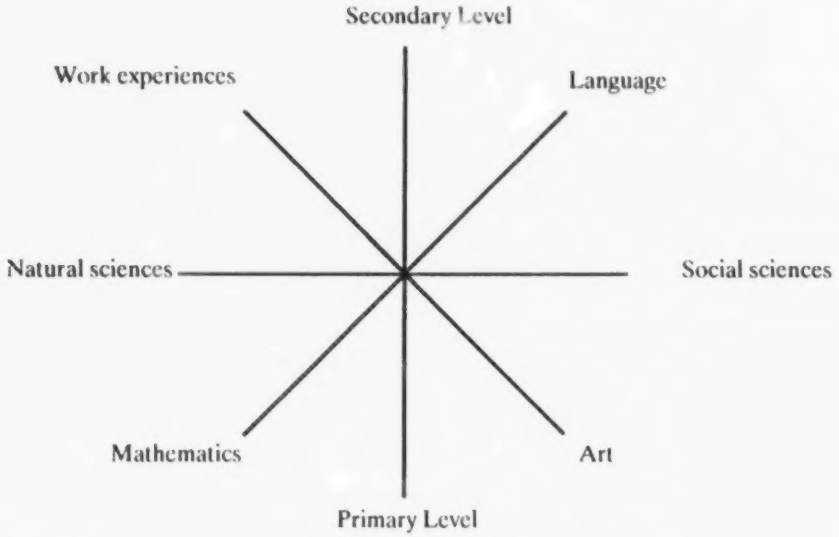
C. Annotation of the model:

(1) **Pressuresfor Curriculum Reforms:** What are the scientific and technological changes, and emerging economic, socio-cultural and political needs and expectations for schools at the

- local community (including parental);
- provincial;
- national; and
- international

levels of activity?

(2) **Curriculum Reforms in School Systems:**



In this Meeting special attention was given to the natural sciences and mathematics, and the social sciences and languages, at both the primary and secondary levels of schooling.

What are the major curriculum reforms, and what are the patterns or trends emerging regarding these reforms? What is the extent of the match between overt curriculum versus hidden curriculum considerations?

(3) **"New" Competencies and Proficiencies Required of Educational Personnel:** What knowledge, skills and sensitivities/attitudes are required of teachers, senior staff, educational administrators and other relevant personnel to enable them to effectively implement the mega-trend curriculum reforms? This should be examined in terms of:

- Theoretical foundations of knowledge (e.g. philosophical, sociological, psychological).
- Performance criteria basis (teaching, assessment, education skills etc.).

(4) **Current Patterns of Teacher Education:** In what ways, and to what extent, are teacher competencies and proficiencies (foundational, and pedagogical practical experiences) currently developed in teacher training programmes? How are these developed? To what extent is there a gap between the ideal and the current situation, and what adjustments need to be made to ensure a reasonable match between these two considerations?

(5) **Reforms in Teacher Education:** What restructuring is required to enable teacher education to enhance its contribution to educational innovation for development? What research, innovations and technologies are required? How can various subject areas and courses in the areas of teacher education (general, such as science, maths, language, social science courses; and foundational, such as psychology, philosophy, sociology; and pedagogical courses) be integrated? In addition, how can theory and practice be effectively linked? What competencies and proficiencies need to be developed amongst teachers to effectively reach out to, and effectively educate, disadvantaged groups? How can the professionalization and occupational status of teachers be substantially improved?

(6) **Research and Evaluation:** There is a need to monitor the implementation of the mega-trend curriculum reforms. This will largely occur in terms of the following two levels

- at the *level of teacher education* to ensure that effective reform is occurring to adequately prepare teachers with the competencies and proficiencies required in schools;
- at the *macro (systems) level* to ensure that teacher education reforms are contributing adequately towards satisfying the pressures for curriculum reform.

III. Mega-Trends in Curriculum Reforms

In this section of the report, some of the most important curriculum reforms over approximately the last decade that seem likely to be sustained in the 1990's are identified. These major curriculum reforms will be referred to as "Mega-Trends" for they are the "gateways" to education in member countries in Asia and the Pacific region (as well as elsewhere) for the 21st century.

When applied to describe curriculum reforms, mega-trends refers to those changes in the content, philosophical underpinnings and approaches of the school

curriculum that do not come and go readily. As John Naisbitt and Patricia Aburdene describe them in their recent (1990) book *"MEGA-TRENDS 2000"*:

"These (large scale educational) changes are slow to form, and once in place they influence us for some time – between seven and ten years, or longer. They have the scope and feel of a decades worth of change". (P.1-2).

(1) **Education for All:** This refers to curriculum reforms which seek to accommodate the fact that learners are heterogeneous rather than homogeneous with regard to their interests and capabilities, and that the curriculum should cater for those with both academic and more practical interests. It also stresses the view that learning is a life-long process, and not confined to those activities that occur in the formal school system or during the formal school years.

(2) **Relevance of the Curriculum to the Individual and Society:** This trend in the curriculum recognizes that the needs of the individual and society may not always coincide; and that what is taught in schools should seek to accommodate the needs of both the individual and society as a whole. Such concerns involve the application and applicability of what is taught in schools to the short-term (but also the long term) needs and interests of learners. Likewise, it also involves the selection of issues/trends that are of local, national, regional and universal concern and that are relevant to the needs and problems of the individual and the society in which he or she is located.

(3) **Development of Appropriate Values and Attitudes:** All societies in the region are making modifications to the content and processes of their school curriculum in order to try and ensure that what are regarded to be "desirable" attitudes and values are cultivated in their populations. In some cases this may involve the instilling of an agreed-upon stock of acceptable core values and attitudes, while in others it may stress an acceptance of a truly "multi-cultural" society. This curriculum reform also seeks to teach about how to deal with conflict situations when there is a clash in values between individuals, and or between the individual and society.

(4) **Development of Process Skills**. A key trend has been the move towards a curriculum that does not just involve factual recall, but also encouraging and teaching learners how to think for themselves, and how to develop the ability to move from convergent to divergent thinking.

(5) **Concern with Meeting the Needs of the Whole Individual:** The curricula in schools have been reformed to reflect the fact that learners are complicated, with different needs that warrant serious consideration and development. At the same time such reforms recognize the holistic nature of the learner and the fact that learner development is not

standardized in terms of its nature, or in terms of the rate at which it occurs between different individuals.

(6) **Maximizing the Full Potential of Each Child, Irrespective of Socio-Economic Status:** Moves have occured in designing the content of the school curricula in many countries to identify and accommodate the particular needs and interests of disadvantaged population groups such as girls/women, learners from low income backgrounds, ethnic/racial minority groups and those living in isolated regions. In doing this such curricula reforms have sought to achieve equality of opportunity in schooling for these groups of learners, and sometimes have also been concerned with forms of positive discrimination in favour of the disadvantaged.

(7) **Learner-Centred Learning and Teaching:** Much curriculum reform has been concerned with achieving a move from subject-centred to child-centred education, in terms of both curriculum content and the teaching and assessmemt methods adopted in schools. Such moves have stressed capitalizing upon the interests and motivations of learners from where they themselves currently stand, encouraging independent study skills and initiative on the part of the learner, and choosing teaching and assessment methods that suit the particular needs of the individual.

(8) **Mastery Learning:** This has resulted in the design of curricula that stress, as part of its offerings, performance criteria to help ensure that the learner explicitly masters particular areas of knowledge and skills.

(9) **Holistic/Performance Evaluation:** This stresses the value of adopting a holistic rather than a segmented approach to the setting up of teaching and learning situations, and the adoption of methods of assessment that encourage such an approach to the curriculum.

(10) **Coping with and/or Managing Change:** The school curriculum is increasingly reflecting the fact that we live in an era of rapid, often very dislocating, social change, and that learners need to be provided with the knowledge and skills required to enable them to effectively adapt to such change. Learners are also being taught how to manage, as well as cope with, change.

For each of these trends in curriculum reform participants considered:

(1) In what sense are these trends 'new'? What is the current emphasis, and how does this make them different to what has been stressed in the past?

(2) What are relevant illustrative examples of each trend in terms of: the natural sciences and mathematics and the social sciences and languages; at the primary/secondary levels of schooling?

(3) What are the implications of these trends for the knowledge, skills and sensitivities/attitudes required of teachers in schools?

(4) What is teacher education currently doing (and what does it need to do in future) to develop the teacher competencies that are required in the light of points (1) to (3) above? Strategies, materials. etc. were considered.

IV. Competencies Required of Teachers for Each of the Mega-Trends in Curriculum Reform

When considering what are the teacher competencies required for each of the mega-trends in curriculum reforms outlined in part 3 of this Chapter, participants at the Study Group Meeting considered the relevance of these trends for: particular subject areas in terms of the natural sciences and mathematics and the social sciences and languages. They also examined whether, and (if so) in what ways the teacher competencies required to effectively implement these curriculum reforms varies according to whether the teachers in question are working with learners at the primary or the secondary levels of schooling. In Chapter Three, they considered which of these curriculum reforms are CORE trends and so are not subject or level specific.

The teacher competencies listed under each of the "mega-trends in curriculum reform" are for illustrative purposes only, for the list is not intended to be exhaustive.

When considering the response of teacher education to preparing teachers with these competencies we need to recognize that at least in some countries recruits into teaching are often of a poor quality with regard to their academic background when compared to those who enter other professions. This has important implications for the content, strategies and materials adopted in teacher education programmes. For example, perhaps there is a need for a more "hands on" approach, and for these to be less theory of a type that is overly difficult for these student teachers and teachers to cope with. Yet, if such an approach is overemphasized this may contribute to an atheoretical approach to teacher education which, itself, is open to criticism.

1. Education for All:

An ability to:

- accommodate diversity in learners;
- enhance learner achievement and so:
  - evaluate achievement against agreed norms;
  - interpret the norms set for achievement and the results of evaluations undertaken; and
  - sustain/motivate learners to maximize achievement levels;

- convert intended learning outcomes regarding the curricula into relevant applications;
- nurture life-long learning skills.

2. *Relevance of the Curriculum to the Individual and Society:*

An ability to:

- apply knowledge and skills to the real-life problems of learners;
- facilitate learning that isrelevant to thelearners own background and existing knowledge, while at the same time also moving on from this point to wider considerations;
- nurture motivation for learner performance;
- make societal/macro concerns relevant to individual learners.

3. *Development of Appropriate Values and Attitudes*

An ability to:

- develop learning environments/situations that will help develop such "appropriate" attitudes and values;
- deal with conflict situations which may arise when there is a clash of values/attitudes in various situations, either between different individuals or else between the individual and society;
- evaluate growth and maturation of attitudes and values in learners.

4. *Development of Process Skills:*

An ability to:

- identify the various process skills, these being: thinking; evaluating; observing; measuring; classifying; finding space/space and space/time relationships; using numbers; organizing data and communicating; inferring; predicting; formulating hypothesis; defining operationally; identifying and controlling variable; experimenting; and interpreting data and drawing conclusion.
- identify appropriate process skills for particular learning and teaching situations;
- evaluate the limitations of particular process skills for particular situations.

5. *Meeting the Needs of the Whole Individual:*

   An ability to:

   - recognize learners' many domains of development and the interaction among these domains;
   - recognize that learners' development occur at different rates and at different times;
   - create appropriate learning situations in the light of the previous two points;
   - develop evaluation methods that reflect the holistic nature of the learning and the learner.

6. *Maximizing the Full Potential of Each Child Irrespective of Their Socio-Economic and Cultural Characteristics, with special relevance to the needs of disadvantaged population groups*

   An ability to:

   - diagnose the needs of each learner in terms of their socio-economic, cultural, physical, cognitive and affective characteristics;
   - identify and appreciate the benefits and limitations of the characteristics of disadvantaged children, and the implications at these for the choice and implementation of appropriate learning/teaching methods and materials;
   - identify the strengths and shortfalls in learners and to then adopt teaching/learning techniques and materials that mobilize and enhance the strengths and compensate for the shortfalls.

7. *Learner-Centred Learning and Teaching:*

   An ability to:

   - mobilize and enhance learner activities and interaction in the learning situation;
   - match the learning, and appropriate teaching/learning content and materials, to the individual attributes of the learner;
   - encourage initiative and independent study skills on the part of learners;
   - use various forms of learner-centered methods of assessment such as criterion referenced assessment techniques.

8. *Mastery Learning:*

An ability to:

- facilitate initial learning, reinforcement of learning and the application of learning;
- provide for the prevention, discouragement and minimization of learning difficulties;
- provide for remedial learning and instruction.

9. *Holistic/Performance Evaluation:*

An ability to:

- ensure that there is consistency between whole-learner development and the multi-evaluation modes appropriate for a particular learner;
- use evaluation information to plan appropriately sequenced teaching-learning activities for the learner.

10. *Coping with and/or Managing Change:*

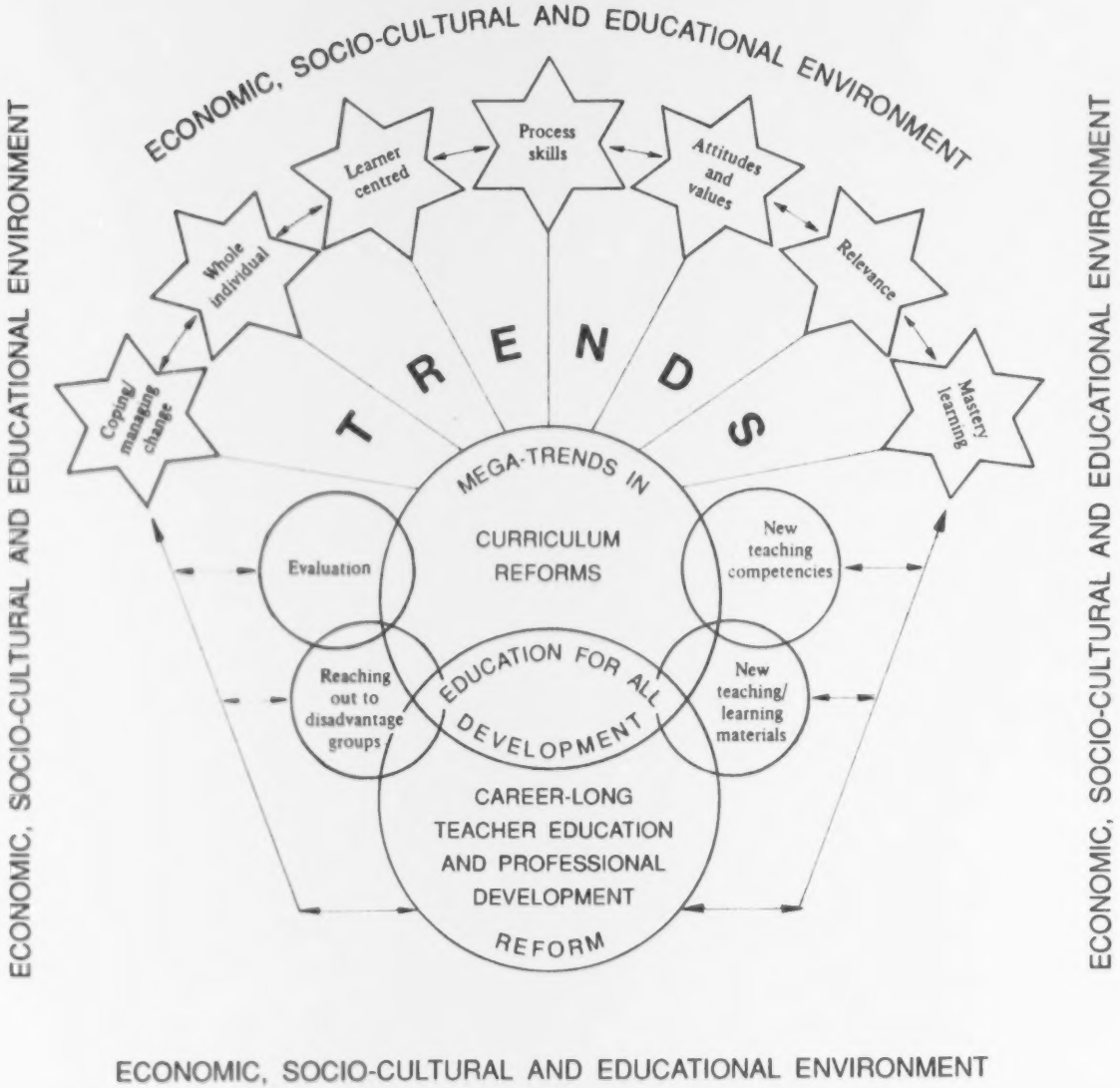
An ability to:

- identify that change is occurring in society and to map the nature of these changes in terms of directions, quality, etc.;
- discriminate between the changes that need to be *coped with* and those that can be *managed*;
- identify competencies to be developed in learners in order to achieve those things identified in the previous two points;
- provide for appropriate learning opportunities to achieve the above;
- evaluate how the learners perform and to make and implement any necessary adjustments.

V. Teacher Education in Support of Mega-Trends in Curriculum Reform

The illustrative model presented below seeks to represent in diagram form the inter-relationship between the mega-trends in curriculum reforms occurring in member countries, the development of new teacher competencies (and teaching/learning materials) required to implement these reforms at the school level, and the modification of the systems of teacher education (at both the pre-service and in-service levels) to help effectively develop these teacher competencies.

Teacher Education in Support of Mega-Trends in Curriculum Reform



The model also illustrates the fact that: particular attention should be given to the often special schooling needs of disadvantaged population groups; and, the need for these to be a constant evaluation and monitoring of the processes involved and programmes developed so that, where necessary, adjustments can be made to ensure that the process model is functioning effectively. In addition, the model presented is shown to be located and embedded in a broader economic, socio-cultural and education environment which has a requirement impact on the nature of the mega-trends that occur and the ability of school systems and teacher education to respond to these.

VI. Illustrative Examples to Show How Such Teacher Competencies Can Be Developed

Section VI of this Chapter which follows, provides detailed examples of how "new" teacher competencies that are required as a result of the mega-trend curriculum reforms outlined earlier can be developed by systems of teacher education, paying special attention to the needs of disadvantaged population groups and the importance of distance education in reaching practicing teachers.

The writing up of each of these illustrative examples adopts the following sequence:

- A brief write-up of the mega-trend;
- A detailed description of the competencies required to contribute to the realization of the goals of the mega-trend;
- An identification of the strategies required to develop the competencies for teacher training;
- Illustrative examples which show some ways in which such competencies can be developed.

MEGA-TREND IN CURRICULUM REFORM NO. 1 : EDUCATION FOR ALL

Describing and Analysing Learning Tasks

1. Mega-trend

The acceptance of the principle of Education for All by a country and the provision of sufficient places in the school classrooms amounts only to an invitation to learn. This principle would become a practical reality only when every child is not only present in the classroom but, in addition, achieves the intended learning outcomes of the curriculum. It is the teacher who has to facilitate this process of learning, by arranging the external conditions in relation to the internal conditions of the learner (i.e. his entry characteristics).

It is clear that most of the countries have achieved the first step of 'inviting all to learn'. Yet the success rate at the second step of ensuring that 'all do actually learn' is not so convincing. This is an area that needs further development, urgently.

2. Teacher Competencies

With respect to any learning task usually there would be some variability in the entry characteristics of the learners (including their stage of intellectual development and their previous experiences). Unless the teacher is competent to accommodate, in his lessons, this learner diversity , he would be bewildering some of his students and boring some others.

Effective teaching would involve the gauging of the position of each of the learners in relation to any new learning task, and subsequently, taking each one of them, from his own starting position, towards the intended terminal learning outcome. In this process all learners are to reach a prespecified minimum level of achievement and those who show greater potential are to be provided opportunities to proceed, as far as they are able to, beyond the minimum level.

While it is essential that classroom interactions end in the achievement of the immediate and the more explicit intentions of these interactions, it is highly desirable that the learners leave the classroom situation with motivation and a capacity to pursue problems and issues emerging from what they learnt. The ability of a teacher to convert

intended learning outcomes of curricula into applications that are patently relevant to the learner can go a long way in setting him on the path of life-long learning.

Thus the teacher competencies that are critical to making 'education for all' a reality may be summarized as follows:

Ability to:

- accommodate diversity in learners;
- enhance learner achievement and so:
  - evaluate achievement against agreed norms;
  - interpret norms set for achievement and results of evaluation;
  - sustain/motivate learners to maximize achievement;
- convert intended learning outcomes of curricula into relevant applications;
- nurture life-long learning skills.

3. Strategies for Teacher Training

For the trainee to acquire the above competencies it is basic that they get into the habit of tearing apart the gross learning tasks, that they would set for their students, into smaller but discrete, component learning tasks and subsequently analyzing these sub-tasks, to comprehend their nature and to explore the possibilities of providing links for further learning both within and without the classroom.

The ability to use the procedures referred to as (a) learning task description; and (b) learning task analysis are useful sub-competencies for teachers on their way to achieving the earlier mentioned competencies.

4. Illustrative examples

Describing learning tasks

At the initial stage of writing learning objectives for a lesson or a unit we concentrate on the most relevant and critical aspects to be learned. In other words, at that stage we describe the expected gross terminal behaviour of the learner. Such statements may be called the *terminal objectives*. However, in order for the learner to perform the gross task he may have to perform a number of, small, sub-tasks. Some of these sub-tasks, the learner may have learned previously. In that case the learner must recall his previous learning related to such sub-tasks when learning to perform the new task. Some of the sub-tasks, the learner may have to learn anew. In order to plan the lesson we should identify all the sub-tasks relating to each terminal objective. If we state, separately, an instructional objective in relation to each sub-task we, then, get the *enabling objectives.*

An example to illustrate the process of identifying enabling objectives in respect of a terminal objective

Terminal objective: Explains the phenomenon of the development of insecticide resistance in insect populations.

In order to perform this task of "explaining ...." the learner has to perform many mental tasks. Firstly he has to recall many concepts and several principles. These constitute the sub-tasks (the sub-tasks being cognitive tasks in this case).

Recall the concept 'population'
Recall the concept 'variation'
Recall the concept 'mutation'
etc.
Recall the principle of differential reproduction, etc.

The learner then has to organize these concepts and principles into an adequate explanation.

When we wish to either teach any of the sub-tasks or find out whether the learner can already perform them we need to state them in the form of learning objectives – that is, as observable learner actions. They form the enabling objectives.

Defines the concept 'population'
Explains the term 'variation' etc.

Fixed-Sequence Learning Tasks and Variable-sequence Learning Tasks

Some learning tasks are seen to have a more or less fixed sequence of sub-tasks. The simpler motor procedures and even some cognitive tasks are such fixed-sequence tasks.

e.g. Tying knot
Preparing boiled cooled water for drinking
Mathematical computations

Even in the case of complex motor tasks which, as a whole, do not have a fixed-sequence, some parts of the task may have a fixed sequence.

e.g. Driving a car
Riding a bicycle

Most cognitive learning tasks cannot be considered to have fixed sequences of universal applicability.

Fixed-sequence learning tasks can be described using flow diagrams. A flow diagram clearly shows the different sub-tasks and the sequence in which they are to be performed.

Describing Variable-sequence Tasks

For most cognitive tasks it is difficult to assign a definite sequence of sub-tasks. It may indeed be difficult even to identify the sub-tasks comprehensively. Yet for purposes of designing teaching learning activities it is necessary that we attempt to describe the task in as much detail as possible and arrange the sub-tasks in some reasonable sequence. We have several sources to gather information about sub-tasks and their sequence in regard to cognitive tasks. Some of them are mentioned below.

1. Consult experts.
2. Observe experts teaching the task.
3. Ask persons, who can perform the task adequately, to 'think aloud' while performing the task.
4. Refer to good textbooks, programmed instructional materials, manuals etc. and find out how they have dealt with the tasks in question.

It would be excessive to attempt flow charting such variable sequence tasks. Mere listing of sub-tasks in a preferred sequence would be sufficient to serve as a basis for designing instruction.

The Uses of a Task Description

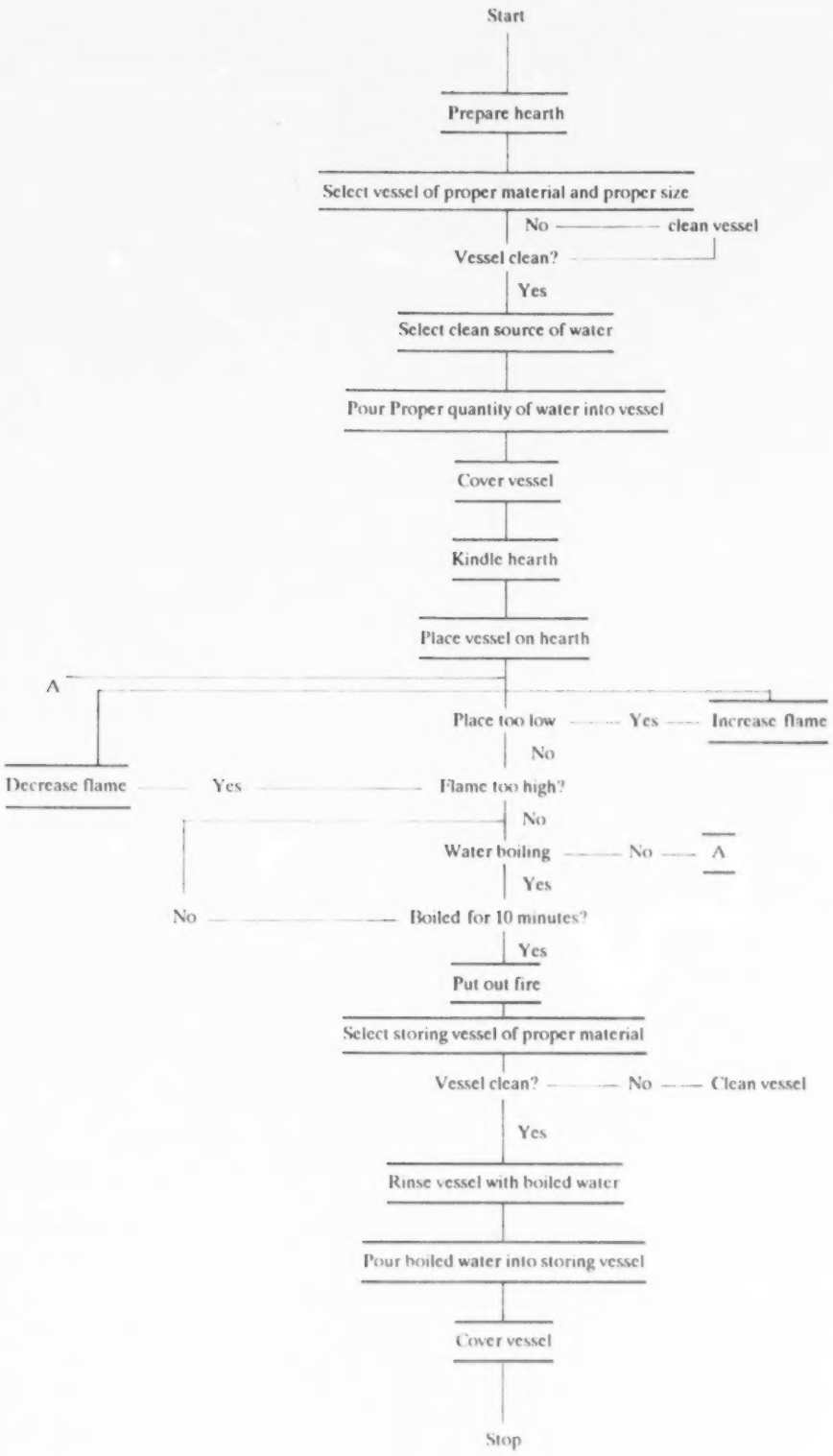
A task description would help a teacher to:

1. identify the sub-tasks;
2. identify the/a sequence in which the sub-tasks are to be performed by the learner;
3. determine essential content and exclude unnecessary content; and
4. undertake a 'task analysis' (which is the next step in the process of designing instruction).

Example

The gross learning task: Preparing boiled cooled water for drinking, using fire wood hearth.

Task description:


Start
Prepare hearth
Select vessel of proper material and proper size
No
clean vessel
Vessel clean?
Yes
Select clean source of water
Pour Proper quantity of water into vessel
Cover vessel
Kindle hearth
Place vessel on hearth
A
Place too low
Yes
Increase flame
No
Decrease flame
Yes
Flame too high?
No
Water boiling
No
A
Yes
No
Boiled for 10 minutes?
Yes
Put out fire
Select storing vessel of proper material
Vessel clean?
No
Clean vessel
Yes
Rinse vessel with boiled water
Pour boiled water into storing vessel
Cover vessel
Stop

Analysing Learning Tasks

A task description tells us only the sub-tasks that the learner should perform and the/a sequence in which he is required to perform them. A task description in no way considers the *characteristics of the learner* or *how he learns.*

At the stage of task analysis we ask at least three questions.

01. What should the learner be capable of doing, when he enters the learning situation, if he is to succeed in learning the task, within the available time and resources? When we answer this question, we get the *required entry behaviour* of the learner.

02. What *types of learning* are involved in the task? Types of learning here refer to the learning of *concepts, rules/principles, problem solving, motor skills and acquiring attitudes?* We need this information as the conditions for the different types of learning are different. Hence identifying them would enable us to arrange the required conditions for each of the respective kinds of learning.

03. Are there any special conditions or constraints under which the learner should be able to perform the task?

Answers to this question would enable us to make special provisions within the teaching learning situation. The special conditions referred to here may be:

a. environmental conditions – e.g. the learner having to perform the task at a special ambient temperature or while being watched by a group of specified persons;

b. operator conditions – e.g. the learner having to perform the task under some restriction such as being blindfolded;

c. social conditions – e.g. the learner having to perform the task as a member of a group etc.

04. Which of the sub-tasks are appropriate for the age and maturity of the learner?

MEGA-TREND IN CURRICULUM REFORM NO. 2 : RELEVANCE OF THE CURRICULUM TO THE INDIVIDUAL AND SOCIETY

I. Mega-trend

A closer analysis of the curriculum in the elementary and secondary schools will reveal that most of its curricular contents call for a unidisciplinary/interdisciplinary approach to instruction with the intent of presenting problems, issues and trends that are of local, national, regional and universal concerns. All these lessons, by and large, are presented in graduated difficulty and are basically tailored to the needs of the learners. And to make the teaching of elementary and secondary school subjects more functional, attempts had been made by the curriculum writers to include in the curriculum selected concepts/issues/trends that are relevant to the needs and problems of individuals in a given society.

2. Teacher Competencies

Making the elementary and secondary curriculum relevant to the needs, problems and aspirations of individuals in the country is the foremost task of social studies education. This task calls for a number of teacher competencies that will enable the teachers to present real life case studies that have practical applications in one's daily life. In this connection, the competencies that have to be dealt with are the ability to:

- apply knowledge and skills to real-life problems of the learners;
- facilitate learning that is relevant to the learner's own background and existing knowledge, while at the same time also moving on from this point to broader considerations;
- nurture motivation for learner performance; and
- make societal/macro concerns relevant to individual learners.

Note: Each of the competencies listed above could be treated singly in every lesson or in clusters considering that two or three competencies could be intertwined in the unfolding of lessons.

3. Strategies for Teacher Training

A continuing assessment of the curricular offerings in the elementary and secondary social studies is needed to make the curriculum relevant to the needs and problems of the individuals and the society. This endeavour will need a number of strategies like the following:

- Identify in the curriculum the concepts/topics that have relevance to the individual and to the country.
- Interview a number of people of varying ages and having different occupational activities about the more common problems/issues that have to be met in the community.
- Prepare a list of the common concerns that are found in the existing curriculum. Add to the list the problems/issues given by the people in the community. Then categorize the common concerns into clusters of concepts. Typical examples of these common concerns are the following:
  - utilization of resources
  - environmental conservation
  - drug education
  - human rights teaching
  - regional co-operation
  - global education
  - peace education
- Formulate sub-concepts and related ideas for each key concept. This will enable the teacher to break down the big lessons into smaller lesson thereby facilitating the process of organizing and simplifying each lesson.
- Integrate the common concerns in the existing social studies curriculum in graduated difficulty both in the elementary and secondary school levels.
- In the development of the lessons the teachers should bear in mind what the common concerns can do for the individual and for the society.

4. Illustrative Examples

Social studies educators can use a variety of teacher-training modes that will help ensure effective instruction in the classroom. The thrusts of the teacher training modes could be toward the utilization of the inquiry processes and valuing processes so as to contribute directly to such educational goals as thinking ability, human relationships, civic responsibility, economic competence and self realization as Nelson and Michaelis put it.

(A) Inquiry Processes

Most of the concepts/topics built-in in the social studies curriculum lend themselves to the *inquiry processes*, particularly those that have relevance to the way of life of the people living in a given society. Social studies educators, by and large, have their own models for inquiry as reflected in the models of Beyer, Nelson, Fenton, Foz, Lippit, Lohman, Suchman, Goulson, Goldmark, Michaelis, Hoover, Massialas and others. However, all the foregoing models have common built-in inquiry skills like:

- observing
- identifying categories
- formulating hypotheses
- predicting
- verifying predictions
- testing hypotheses
- generalizing

Ex. Directed Inquiry Experiences

- *Observing* the landforms found in a given region
- *Categorizing* the landforms on the earth's surface
- *Formulating* hypotheses about the formation of various landforms on earth
- *Predicting* what will happen to certain landforms within a given time frame
- *Verifying* the predictions about the changing surface of the earth
- *Testing* the hypotheses formulated in the light of the data gathered; and
- *Formulating* generalizations about the study of landforms. Relate the changing surface of the earth as reflected in the formation of different landforms to the way of life of the people and to the society where they belong.

(B) Valuing Processes

A run down on the concepts/topics included in the social studies curriculum will show that most of the learning experiences therein can be processed through the *valuing processes* as expounded by Beyer, Michaelis, Hoover, Raths and others. Just like the inquiry process, the valuing models have certain components which are identified as basic strategies in teaching like the presence of dilemma/conflict, alternatives towards the solution of problems; mechanisms for decision-making; and giving rationale for the choice made, hence, the processing of information is focused on the

moral discussion level. The valuing skills common in the valuing models in the social studies are the following:

- presenting a *dilemma*
- presenting *alternatives* toward the solution of the problem
- collecting *relevant facts* that are supportive for one's choice from the alternatives given
- analyzing the *reasons* for one's choice
- considering the *consequences* of choices
- clarifying the use of *value criteria* in making judgment
- considering ways of *resolving conflicts*
- *acting freely* in terms of one's choice

Ex. Directed Valuing Experiences

- presenting a *dilemma* about the utilization of forest resources (re-continuing exportation of logs to other countries or not)
- presenting *alternatives* on the choices, that is, whether to continue the exportation of logs or not
- gathering *facts* to support one's choice
- giving *reasons* for the non-exportation of logs and/or continuing exportation of logs to foreign countries
- presenting ways and means of resolving conflicts with regard to the *possible consequences* of massive deforestation in a given area
- *acting freely* in terms of one's choice with regard to the wise utilization of forest resources
- giving *value laden generalizations* about the use of forest resources.

Note: Relate the generalizations to the way people value the forest resources in a given community. Show the relevance of the availability of forest resources to the way of life of the people in a given forest community.

MEGA-TREND IN CURRICULUM DEVELOPMENT NO. 3 : DEVELOPMENT OF APPROPRIATE VALUES AND ATTITUDES: PROVIDING LEARNING ENVIRONMENT

In general, education aims to develop the individual in order that he or she can become responsible for his own well-being as well as contribute to the family, society and nation. Such development incorporates all domains of the individual: intellectually, spiritually, emotionally and physically; the development of talents; and the fostering of moral, aesthetic and social values. As such the inculcation of desirable attitudes and values in the learner becomes an essential component in the education process.

In the past the inculcation of values and attitudes has been very much left to the Religious Education/Moral Education/Discipline teacher. But such inculcation is a lengthy process, needing continuous reinforcement. Therefore it is necessary that every teacher be made equally responsible for this undertaking, in and outside of the classroom.

Teacher Competencies

In order to develop desirable values and attitudes in the learner the teacher will require the following competencies:

1. To provide learning environments/situations that will develop the desirable attitudes and values:
   - identify/create learning environments/situations where the development of attitudes and values can take place;
   - use different methods to develop values and attitudes appropriate to the learning situation and learner;
   - make himself (teacher) the model for the learner.

2. To deal with conflicts of values which might arise in the learning process:
   - to deal with conflicts of values:
     a) in the materials being studied;
     b) between the learner and society;
     c) between different learners;
     d) between himself (teacher) and the learner;
   - to be open-minded and to withhold judgement when learners are discussing values.
3. To evaluate the growth and maturation of attitudes and values in the learner:
   - use different modes of evaluation;
   - aware of the inadequacies of existing modes of evaluation

Strategies for Developing Teacher Competencies:
To provide learning environments/situations that will develop the desirable attitudes and values.

Multiple strategies have to be used.

A. Lecture-Discussion-Demonstration-Practice (Pre-service and In-service)

1. Lecture to be followed by discussion to enable the teacher to understand the need to develop values and attitudes.
2. Brainstorming session to discuss what are these desirable attitudes and values and to produce a list of these. Compare this list with the values and attitudes contained in the official documents. Discussion and clarification of these values.
3. Brainstorming session to come out with (a) a list of competencies a teacher needs in order to develop these values; (b) suggestions on ways to develop these competencies in the teacher; (c) a list of competencies that the teacher already possesses.
4. Lecture to be followed by discussion on learning environments/situations for developing values and attitudes:
   a) in the classroom:
      - the subject matter already contains values;
      - the subject matter can be used to illustrate certain values;

- the learning activities enable certain values and attitudes to be put into practice, e.g. in group work learners have to co-operate, share materials, take turns to speak or respect other people's views.

b) co-curricular activities:

- the activities themselves already contain values e.g. doing charity work in the Girl Guides Movement;
- the process of organizing activities enable learner to practice/observe certain values e.g. being systematic in keeping accounts.

c) other school activities:

- Organized activities e.g. assembly, school concerts;
- non-organized ones e.g. queueing at canteens, throwing rubbish into the bins.

5. Lecture, discussion and demonstration of the various methods of inculcating values e.g.:
   - formal and explicit in the teaching;
   - through examples, e.g. highlighting a learner's good behaviour.
6. Demonstration using videos of learning situations where values are being developed. This to be followed by discussion in relation to Nos. 4 and 5 above.
7. Group work to identify/develop learning situations and the appropriate methods for inculcating values. This to be followed by the preparation of lesson plans to be used in peer group teaching or in the classroom. Such teaching to be supervised by peers or lecturer with feedback and discussion.
8. View videos of teachers in different situations to see the extent to which they are or are not models of desirable attitudes and values to their students. This to be followed by discussion.

B. Via Practicum (for Pre-service only)

C. Via personality development of the trainee throughout the duration of the pre-service training (for pre-service only)

D. Via effort of the Headteacher and peers to help the teacher to become the model (for in-service only).

Illustrative Example: *The Teacher as Model*

1. Discussion on the topic "values are caught rather than taught", to make teachers aware of the great influence that the teacher has on learners. Therefore teachers must not only preach but also practice and exhibit positive values and attitudes in accordance with societal values and norms.
2. Brainstorm on the values and attitudes that the teacher can actually exhibit in the course of his work inside and outside of the classroom. This session is to result in a list of values/behaviours such as the following:
   - punctuality in arriving at school, coming into class;
   - clean and tidy physical appearance;
   - shows respect when dealing with learners e.g. do not call them 'stupid';
   - shows sympathy and empathy when dealing with learners from disadvantaged backgrounds or when learners are in trouble;
   - meticulous in making learners' exercises.
3. Watch video on how teachers conduct themselves inside and outside of the classroom. This to be followed by discussion on the extent to which particular behaviours of the teacher promote positive or negative attitudes on the part of the learners, and how certain behaviours could be modified/changed in order to develop the desired values in the learner.
4. Role play some learning situations inside and outside of the classroom. This is to be followed by discussion.
5. Some measures have to be taken to remind teachers of the need for them to constantly practice and exhibit desirable values such as by means of:
   - peers reminding each other (this has to be agreed upon by all those involved);
   - self-evaluation through a using of checklist.

MEGA-TREND IN CURRICULUM REFORM NO. 4 : DEVELOPMENT OF PROCESS SKILLS: PROBLEM SOLVING

1. Mega-trend

The movement away from solitary focus on facts, and the corresponding need for the development of mental skills, (which by nature are transferrable to a variety of situations, including those in real life application) has emphasized process skills in many learning areas of the curriculum in all countries of the region.

Problem solving incorporates, in a functional way several of the process skills.

The emphasis given to problem solving is clearly a new trend in school curriculum development in almost all countries of the region. Its benefits as a learning vehicle are many, such as:

- active participation by the learner in the learning;
- enhanced motivation for learning, in particular for self-learning;
- cognitive operations beyond factual recall, such as divergent and critical thinking, and application of learning;
- enhancement of several affective domain proficiencies, such as perseverance, curiosity, excitement of creativity;
- high functional utilization potential, such as application to real life situations to improve the quality of life, and for nurturing talent.

2. Teacher Competencies

To be able to facilitate problem solving competencies and proficiencies in learners, the teacher, herself, has to acquire a set of foundational competencies and proficiencies, such as:

- identifying the various process skills;
- identifying the appropriateness of various process skills for particular situations;
- identifying the limitations of the process skills when applied to particular situations;

If the teacher is to support and facilitate the nurturing of problem solving abilities in children, the teacher herself has to be a mature problem solver, and one with a commitment to the efficacy of problem solving as a learning vehicle.

3. Strategies for Teacher Training

This implies that teacher education has to incorporate in its training episodes, a significant component of problem solving. Since this proficiency is a generalized one, its development also must necessarily incorporate this generalized attribute i.e., problem solving needs to be pervasive throughout whatever learning is undertaken in the teacher education courses, whether in subject matter content areas, or in pedagogical areas, or in any other, so that a positive mental set (or habit) is established in the teacher trainee to solve problems in diverse situations, both as individuals and collectively, as members of peer groups.

This implies the exposure of the teacher trainee to a vast variety of problems, starting with relatively simple ones, to complex ones, of "academic" kind involving essentially thinking and logic and contrived situations, such as those drawn from discipline content areas of the school curriculum; "academic" kind that would involve investigation and experimentation; and others which are holistic, and which would involve real life situations and contexts, even those whose parameters and variables may *not* all be capable of identification.

4. Illustrative Examples

In *Annex I*, are examples illustrative of the potential range of such problem solving situations.

The use of this teacher training mode in several countries has pointed to a number of practical hints that may be kept in mind, such as the following:

- Problem solving in a variety of situations must not only be encouraged, but also *rewarded*. In parallel, creativity, imagination, divergent thinking must also be encouraged *and* rewarded.
- An authoritarian atmosphere tends to dampen the nurturing of problem solving;
- An atmosphere of success needs to be created, so that the inexperienced problem solver can achieve almost assured success, at the beginning, but as maturity in problem solving develops, additional challenges are provided;
- The learners need to be involved both mentally and physically, hence the range of problems should reflect this requirement;
- The learners need to be encouraged to create their own problems.
- Both individual and group problem solving need to be encouraged.
- Learners need to be encouraged to record their problem solving processes, such as via flow charts, to raise to consciousness their problem solving strategies. (Many steps would be logical. But some may be alogical or intuitive).

Annex I

Illustrative Range of Problem Solving Situations

(Illustrated with Science Content)

Type I : Analysis of a situation

(no experimental investigation)

i) The following table indicates the percentage saturation of Oxyhaemoglobin with oxygen at different partial pressures of oxygen (pO_2):

Percentage saturation of haemoglobin at different pO_2 at pH 7.4 and 38°C

pO2 (mm Hg)	*% Sat of haemoglobin*
10	13 (.5)
20	35
30	57
40	75
50	83 (.5)
60	89
70	92 (.7)
80	94 (.5)
90	96 (.5)
100	97 (.5)

Would there be much difference in the amount of oxygen carried by the haemoglobin if the amount of oxygen in the aleveoli varied because of relatively wide variations in the oxygen in the air? The pO_2 in tissue fluids ranges from 5 to 30 mm Hg. What is the effect of this low partial pressure on the oxyhaemo-globin combination ?

(Possible prompts which may be used, if necessary, are Plot the curve pO_2 vs %sat. In the lungs of a human the pO_2 is 100 mm Hg. What is the % saturation at this level? When the pO_2 of the blood is low, is the % saturation of the haemoglobin high or low?

When the pO_2 of blood is high, is the % saturation of the haemoglobin high or low? Is the relationship between the pO_2 and % saturation a linear one? At the top of the curve, do large changes in pO_2 have a small or large effect on the amount of oxygen carried by the haemoglobin?

What is the effect of small changes in pO_2 below the value of 40 mm Hg.?)

ii) a) The population of flies in the cattle sheds at an experimental station was so large that the health of the animals was being affected. The workers sprayed the barn and the cattle with a solution of DDT. They found that this killed nearly all the flies. Two weeks or so later, however, the number of flies was again large. The workers again sprayed with DDT. The result was similar to that of the first spraying. Most of the flies were killed. But again the population of flies increased, and again DDT spray was used. This sequence was repeated several times. After about five sprayings, it became apparent that the DDT was becoming less and less effective in killing the flies, until finally, spraying with DDT appeared to be virtually useless.

– Construct several different hypotheses to account for these facts.

b) One of the workers noted that one large batch of DDT solution had been made up and used in all the sprayings. She therefore suggested that the DDT solution could have decomposed with age.

– Suggest at least two different approaches towards testing this hypothesis.

c) A fresh batch of DDT was made up. It was used instead of the old batch on the renewed fly population. Nevertheless, despite the freshness of the solution, only a few of the flies died. The same batch of DDT was then tried on a fly population at another cattle shed some 30 kilo-meters away. In this case the results were like those originally seen in the experimental station.

Most of the flies were killed. Here we have two quite different results with the same fresh batch of DDT. The weather conditions at the time of the effective spraying of the distant cattle shed were the same as when the spray was used without success at the experimental station.

– Resolve the problem situation into its major components. Which components were incorporated in the hypotheses originally made? What components have not been incorporated? (Could anything have happened within the fly population that would account for the decreasing effectiveness of the DDT – this is a prompt to be used only if necessary. Other prompts could be – where did the new fly population come from after the first "effective" spraying? Who were their parents? Were the parents among

the more susceptible or the more resistant as far as the effects of DDT were concerned? Which individuals would be more likely to survive the second spraying?)

iii) Ten flies are in a closed cylindrical transparent glass bottle. It is placed on an accurate weighing scale.

Which of the following is correct ?

- The scale will register the most weight when all the flies are sitting on the bottom of the jar.
- The scale will register the most weight when the flies are flying around the jar.
- The weight recorded is the same when all the flies are sitting on the bottom of the jar or are flying.

iv) A stable, large bubble of air is found under water. A powerful light beam shines through the bubble. Which of the following would the light beam do after passing through the bubble ?

- converges
- diverges
- is unaffected

v) You have a thick bright coloured blanket A which is a good heat insulator, and a thin light coloured blanket B, which is a poor heat insulator.

It is a very cold night and you need both blankets. You will be warmest if you:

- put the blanket A on top to keep the cold out of the bed and put the blanket B next to you;
- put the blanket A next to you to keep the heat in, and put blanket B on top;
- either way makes no differences.

vi) Two shiny stainless steel kettles (A and B), containing water, and with loud whistles in their spouts, are heated.

A is heated directly over a gas flame.

B is placed on a heavy thick soft iron plate and the plate is heated over a gas flame.

After they both begin to whistle, the gas flame is turned off.

Which of the following are likely to happen ?

- Both stop whistling in about the same time.
- The kettle (A) which is heated directly, continues to whistle, but the kettle (B), resting on the metal, stops promptly.
- The kettle (B) on the metal continues to whistle for some time, but the one directly heated (A) stops promptly.

vii) A dull rubber bullet and a shiny aluminium bullet both have the same mass, speed and size. They are fired at a block of wood.

Which is most likely to knock the block over ?

viii) In a cold wet cave below the earth's surface, is there less gravity than at the earth's surface which is exposed to sunshine; or more gravity or the same gravity ?

ix) To bring a big pot of cold fresh water to boil over a gas flame, using the least amount of energy, we should:

- turn the heat on full force;
- put the heat on very low;
- put the heat at some medium value.

x) To cook unpolished brown rice in the pot above, using the least amount of energy, we should:

- keep the heat on in full force;
- turn the heat down so that the water just barely boils.

xi) "Fish compress and expand their swim bladder to change depth". "But a fish has no control over its swim bladder". How do they do it?

xii) Masonry walls which become wet and damp near the ground may be prevented from becoming so by grounding the wall electrically (running a wire from the wall to a metal stake in the ground). How would shorting the wall prevent moisture in the wall?

xiii) "The maximum height of a suction pump can be about 33 feet. So all trees should not be taller than 33 feet because sap cannot rise above this". Or is the mechanism of sap rising in a tree different from that of a suction pump?

xiv) Exposed steam pipes are often covered with asbestos to minimize heat loss. This assumes that asbestos is a poorer conductor of heat than room air. In fact it is not. So why do it?

xv) When cooking, if water drops are sprinkled on to a hot dry skillet the drops dance and skim along. With the temperature well above 100 ^{o}C why don't they evaporate immediately? By the way what shapes do the dancing drops take and why?

Type II : Analysis of a situation

(experimental investigation)

i) Carefully stir a cup of hot coffee until there is an uniform swirl. Then carefully pour a stream of cold milk into the centre. What do you observe? Repeat with hot milk. What do you observe? How would you explain what you observed?

ii) The behaviour of fruit flies (drosophila) lends itself to a number of investigations. Initial investigations (say) on mating behaviour could record, interpret and classify such actions as (a) vibration (wing movement of male-speed, one or two wings, parallel or up and down movement, return to rest position, motion bursts, etc.); (b) waving (slow spread of one wing of male outward from body to 90^{o} held in position and relaxed without vibration); (c) scissors movement (open and close movement of both wings); (d) fluttering (by non-receptive females and males courted by males-wings slightly elevated, separated from contact with each other, moved slightly laterally and vibrated rapidly); tapping (male initiates courting with a fore-leg motion); circling (male after posturing at the side or rear of a non-receptive female, circles facing the female); stamping (males stamp their fore-feet). Special attention may be paid to properties that may be measured quantitatively.

iii) Why does a hot piece of toast leave moisture on a plate?

iv) Display behaviour of varieties of animals (such as Siamese fighting fish or fighting cocks) provide many opportunities for systematic observation and the design of sequences for such purposes naturally have in them many opportunities for teaching problem solving skills. Taking the Siamese fighting fish as example (in fact many species of anabantidae are suitable), among the behaviours that can be observed are body and tail postures, colour, rates of gill movement, rates of pectoral fin fanning. Such observations may be made on male/male interaction with separator; male/male interaction without separator.

Among the observations could be time to react; types of initial reactions; main features of display patterns and their rates; does direct fighting occur and what are the main features of fighting (approach, circling, frontal display, lateral display, frontal attack, lateral attack, head ram, jaw lock, subordinate behaviour, especially loss of aggressive behaviour, including folding of fins, colour change).

v) What determines the frequency of the flapping of flags on a flag pole?

vi) Fish schooling provides excellent opportunities for observing social organization under diffused (non-specific) external stimuli. (Many other animals also show mass grouping behaviour, but are more difficult to study in a classroom situation). Species of fish such as Zebra (brachydanio rerio), Harlequin (rasbora heteromorpha), Scissor-tail (rosbora trilineata), Rosy Tetra (hyphessobrycon rosaceus), Tiger Barb (barbus tetrazona) are very suitable for the purpose.

Observations may be made on single species or mixed species in varying proportions. Among the interesting observations that can be made are: Do they all swim in single species? Are there any signs of aggressive behaviour among the fish in the group? Is there a visible "pecking" order in the group? Is there any apparent correlation between density of schooling and "preferred" habitat within the aquarium? What effects on grouping behaviour result from vibrations (tapping on the aquarium frame) and from introducing food? Varieties of common canal fish also show very interesting schooling behaviour. Is there a difference in schooling behaviour of fish in polluted canals as compared with fish in relatively clear canals.

vii) A large magnet placed near a carpenter's bubble level will force the bubble to move. Does the bubble move toward or away from the magnet? How does the magnetic field do that?

viii) Some species of fish show an adaptive colour change to match their environment. What fish may be used for this purpose in the classroom? Under what conditions? What colour changes? How soon? How permanent? (Prompt – start with Angel fish). What principles may be used to select the fish without utilizing a trial and error method?

ix) Select a common invertebrate animal (e.g. millipede). Locate a number of colonies. Compare density in each. Relate density to type of habitat. Is there any evidence of a relationship between density and any environmental factors?

How would you determine the extent to which they move from one microhabitat to another? At what time of the day are they active? (Prompt – tagging animals say with paint spots).

What factors determine the distribution of the animals? Formulate hypotheses based upon field observations. Investigate these animals in "choice chambers" in the laboratory (prompt – conditions such as dark/light, response to other individuals, low/high humidity, variation in responses due to a rhythm of activity within the animal; the physiological condition of the animal in relation to the physical environment; the possible interaction between animals).

If the animals prefer a dark, moist environment and congregate together, how quickly do they lose water?

Do they lose water faster if isolated? (Prompt – weighing one animal in a container about every 20 minutes – what sampling? Weighing a number of animals in a container at the same time periods – what sampling?).

x) Many candles, especially small ones, flicker and pop in the final moments before burning out. What determines the frequency of the flickering? What is the explanation for the phenomenon?

xi) Place a coin in a transparent, open cylindrical jar filled with water. Look down through the water surface. At an appropriate angle, the coin's image seems to be on the surface of the water. If you put your hand on the further side of the jar, usually there is no effect on the image. But if your hand is wet, the image disappears. Why?

xii) If you pour honey or treacle or syrup or thick oil from a height, the stream will force itself into a coil. What affects the diameter and height of the coil? The rate at which it forms? Why does the coiling form?

xiii) An old formula, from Sri Lanka, for a strong adhesive paste states the following:

"Four parts glue are soaked for a few hours in 15 parts cold water, and moderately heated till the solution becomes perfectly clear, when 65 parts of boiling water are added, while stirring. In another vessel 30 parts boiled starch are previously stirred together with 20 parts cold water, so that a thin milky liquid without lumps results. The boiling glue solution is poured into this while stirring constantly, and the whole is kept boiling another 10 minutes".

Is this really a strong paste? How would you alter the setting time of the paste without reducing its strength of adhesiveness?

xiv) A smoothly flowing stream of water from a faucet narrows as it falls? What is the change in the diameter of the stream in relation to the distance from the faucet? Why does this narrowing take place?

xy) How would you explain a rainbow (with demonstrations and activities she could do), to a very bright eighty year old grandmother from the village, who cannot read or write, but has 16 living children and 34 grandchildren?

Similarly, other problems which involve useful application in real life of science/mathematics principles may be utilized. There would be practical activities associated with such problem solving. The following illustrate a few type-examples:

i) In constructing houses, sheds, barns, corrugated sheets are frequently used. Sheets are usually 2'6" width and vary in length from 6' to 10'. When corrugated sheets are laid for roofing, the edges are made to overlap. This overlap (side lap) is usually at least 1 1/2 corrugations (i.e., approx. 4"). The top sheet is laid with the side edge turning downward. In addition to side lap, the ends must overlap as well. The flatter the roof, the greater the end lap must be. Since two pieces of metal are overlapping a given line, additional roof framing will be required there. The usual rule of thumb is 12" rise per ft. use 6" end lap; 6" use 9" end lap and 1' use 12" end lap. The number of sheets for a given roof and their dimensions often need to be calculated. Many other examples from building construction may similarly be utilized.

ii) Associated with Chemistry teaching, (deriving atomic weight proportions from chemical formulae say $(NH_4)_2SO_4$, the percentage of any element in a fertilizer may be calculated, if the chemical formulae and % purity are known. Such calculations will explain what a given fertilizer is composed of and what it is supposed to accomplish.

iii) Farmers need to *estimate* the yields per acre for a given crop (say) for quoting a price to a buyer, computing storage needs, labour requirements during the harvesting season, probable income from a crop. Several sampling techniques may be used and these provide effective exercises in arithmetic and statistics.

iv) The rate of flow of water in a stream to be (small) bunded for irrigation purposes is a first characteristic to be determined. Similarly, the anticipated draw out during the dry and wet season is also required.

v) Determining the horse power motor rating is very useful before buying a machine for a particular job such as raising stone or earth in the construction of a small irrigation dam or pumping water at a particular rate to a particular height.

vi) Tractor speeds are generally calculated in miles per hour or kilometers per hour. When the speed of the tractor and the total distance travelled is known, what is the number of acres or hectares covered for a specific width of land? Knowledge of the number of acres per mile or hectares per kilometer for a specific width of land may be used for several other important calculations, such as calculating the amount of "waste" land a ditch may occupy in the field; help establish the amount of "overlap" a tractor should have in a field for maximum efficiency).

(Two tractors are working at 3 mph. One driver has an average lap of 9 inches; the other driver laps 20 inches each time across the field. Not

considering turning and stops, what is the difference in work done by the two tractors in a 9 hour day, in terms of acres).

vii) It is often necessary to estimate how much "field work" in acres/hour or hectares/hour a tractor can do in a given period of time, such as while estimating the amount of tractor time required, or checking on the efficiency of the tractor work completed.

viii) Frequently the RPMs on agricultural machinery are expressed in number of pounds or kilograms of a specific product (like seeds in seed drills, insecticide or fertilizer or lime) being applied per minute. Power may be conveyed from the power shaft to the tool shaft via belts, gears, chains or combinations of these. Often the same machine may be used to deliver different products at different rates. The possibilities of changing speeds (i.e., delivery rates) such as by changing the revolutions per minute of the driving shaft or by changing the ratio of the diameters of the pulleys on the power shaft and the tool shaft provide opportunities for useful calculations which lend themselves to practical checking and field use.

ix) Calibrating seed drills is essential for systematic planning of farming practices. The primary concern in seeding a crop is the distribution of the correct number of seeds or plants per square foot or square meter. Several methods are in use, such as comparing the amount of seed collected on a simulated seeding or collecting the material distributed by the machine over a known distance and then comparing it with the amount derived.

x) Insecticide sprayers are often pulled by a tractor and have a spring loaded by-pass which maintains a constant pressure at the spray tips. The sprayer requires calibration to ensure that the correct amount of liquid is dispensed over a specific distance or area. For accurate results, the tractor motor and ground speed must remain constant. Further, the tractor must be operated in the same gear as used to set the sprayer's rate of application. Prior to actual pesticide application it is a good practice to calibrate the sprayer using water.

The above examples may also form the basis for enhancing problem solving (and application) skills of teachers at in- and pre-service sessions, by considering more variables that may impinge on the phenomena than would be done at student level.

In this context, one further dimension may be considered – that of intermingling in-service or pre-service training of teachers with training in curriculum development or training in the production of curriculum materials such as teachers' guides, with specific reference to movement towards real life situations and problem solving.

If, during the transition phase from academic to the real life problem solving type, while retaining the same content or national syllabus, but seeking the application of this content in problem solving in real life situations is a tactic to be adopted, then teachers indeed have to be trained to be curriculum developers *and* designers of

problem solving learning sequences, themselves, so that real life situations in the environment of the school may be utilized increasingly for learning/teaching of problem solving, and such learning episodes "plugged in" at appropriate times into the total teaching effort.

If decentralized curriculum development will take place ultimately, then this cadre of trained teachers would from the core for training other teachers to be decentralized curriculum developers. Thus an infrastructure to develop human resources required for such operations would gradually have been built up at sub-national levels in the country, increasing the feasibility of reaching and nurturing the majority of talented children in the country, in rural areas.

Type III : Holistic Real Life

(with investigations/interventions)

(The problem solving ends only after action to solve the problem is taken, but then the results are further monitored and may give rise to further problems that need solution).

i) There are about 45 oxcarts in the village used for transporting fruits and vegetables daily to the market. Almost all of them creak badly and the oxen are seen to be straining hard when pulling the carts. What may be done to improve the situation?

ii) Insect pests are attacking the garden and reducing greatly the quantity and quality of the products. It is dangerous to use the "standard" pesticides. What may be done to overcome this problem?

iii) During the dry season there is always a water shortage in the district. During the rainy season there is "too much" water and some flooding and soil erosion. What may be done to correct both situations?

iv) When the house ghekko chirps three times as you leave the house, it is said to indicate bad luck. Is this really so?

v) Very soon electrification will come to the village. What actions should be taken prior to, during and after the electrification programme, to educate the public about safety, economical use and responsibilities in this regard?

vi) Which illnesses are most common in the village? How do these affect the various age groups? Which of these may be preventable and through what means?

vii) The quality of salt fish made in the community is highly variable and there is a high percentage of wastage. What may be done to increase the efficiency and quality of production?

viii) A number of people and many actions are involved in the annual temple ceremony. What processes are used to implement the actions? Which of these may be done more efficiently? At less cost?

ix) Many local medicines are thought to be very effective in curing several diseases. Is this true?

x) What is the relationship between food calorie consumption and human energy use in work, of people labouring in farms in the village? Is it balanced? Should the situation be improved?

xi) Do the explanations, given by people in the village, for natural phenomena correspond to explanations provided by science? Is this a problem? If so how may the problem be solved?

xii) A politician, during election time, making a speech in the village, claimed that he has increased the employment rate in the district by 200%. Hence people should vote for him. As a student of science what is your reaction to this? What actions would you take in regard to your reactions?

MEGA-TREND IN CURRICULUM REFORM NO. 4 : DEVELOPMENT OF PROCESS SKILLS

1. Mega-trend

All subjects in the elementary and secondary school call for the development of *process skills* to ensure effective learning. The content/subject matter of each learning area which are drawn from the existing curriculum are usually processed to come out with the expected goals of instruction. By and large, it is in the processing of information where the process skills are needed. In most learning areas the process skills are identified in two categories – the *inquiring process skills* (problem solving) and the *valuing process skills*. These process skills could be developed by the teacher in the unfolding of lessons using the inquiry models and the valuing models as the case may be. With the use of varied teaching strategies utilizing the designed process skills for a given lesson, effective learning can be ensured in the classroom. With the foregoing in mind, there is a need to identify the basic competencies that can help teachers in the development of process skills to ensure effective instruction.

2. Teacher Competencies

Being aware of the need for the development of process skills in instruction, the following competencies should be developed to ensure good teaching. These are the ability to:

- identify the various process skills: thinking, evaluating, observing, measuring, classifying, finding space/space and space/time relationships, using numbers, organizing data and communicating, inferring, predicting, formulating hypothesis, defining operationally, identifying and controlling variable, experimenting, interpreting data and drawing inferences.
- identify appropriate process skills for particular situations.
- indicate limitations of particular process skills for particular situations.

Note: In the social studies clusters of competencies could be unfolded in every lesson.

3. Strategies for Teacher Training

The process skills in the social studies are categorized into two: namely, the *inquiry process skills* and the *valuing process skills*. Each of the two categories have structural patterns in the development of lessons such that the inquiry skills and/or valuing skills are developed among the teachers and the students following a learning,

continuum, that is, from the writing of objectives to the identification of content/lessons, to the choice of a teaching strategy and finally to use of appropriate evaluation *tools.

A. Inquiry Process Skills

In the development of inquiry process skills the following can be utilized for teacher training:

1. Identify the concepts/topics/lessons in a particular grade/year level that can be unfolded utilizing the inquiry models for social studies.
2. Study the inquiry models of a number of social studies educators like the following:

Beyer's Inquiry Model

1. Defining the problem
   - 1.1 Becoming aware of the problem
   - 1.2 Making it meaningful
   - 1.3 Making it manageable
2. Developing tentative answers
   - 2.1 examining and classifying available data
   - 2.2 Seeking relationship and drawing logical inferences
   - 2.3 Stating the hypotheses
3. Testing the tentative answer
   - 3.1 Assembling evidence
   - 3.2 Arranging evidence
   - 3.3 Analyzing evidence
4. Developing conclusion
5. Applying conclusions

Joyce and Associates (SRA) Inquiry Model

Phase I :
1. Encounter and reaction
2. Organization of inquiry
3. Operations
4. Reflection and evaluation
5. Conclusion

Phase II: Recycling

Repeat steps 1-5

Nelson's Model of Inquiry

1. Identifying and defining the issue or problem
2. Stating the hypotheses
3. Gathering and evaluating evidence
4. Testing the hypothesis
5. Drawing tentative conclusion and decision making

Fenton's Model of Inquiry

1. Recognizing a problem from data
2. Formulating hypotheses
3. Recognizing logical implications of hypotheses
4. Gathering data to test hypotheses
5. Analyzing, evaluating and interpreting data
6. Evaluating the hypotheses in the light of data
7. Stating a generalization or conclusion

Suchman Inquiry Model

1. Planning for Inquiry Activities
   - 1.1 Identifying goals
   - 1.2 Preparing the problems
   - 1.3 Medium for presenting the problem
2. Implementing Inquiry Activities
   - 2.1 Presenting the problem
   - 2.2 Hypothesizing and data gathering
   - 3.3 Closure
3. Evaluating Inquiry Activities
   - 3.1 Evaluating process
   - 3.2 Evaluating content

Goulson's Tri-Question Approach

For Contemporary Events:

Question 1 : What happened?

Question 2 : Why did it happen?

Question 3 : What could be the consequences?

For History:

Question 1 : What happened?

Question 2 : Why did it happen?

Question 3 : What were the consequences?

Goldmark's Inquiry Model

1. Recognition of the need for inquiry
2. Stating hypotheses
3. Gathering data
4. Analyzing alternative hypotheses
5. Identifying criteria (reasoning)
6. Identifying values and assumptions
7. Inquiry into inquiry

Hoover's Inquiry Model

1. Recognizing and stating the problem
2. Clarifying the issues
3. Planning and developing learning activities
4. Collecting data
5. Reporting procedures
6. Giving generalizations
7. Evaluating experiences

Massialas' Inquiry Model

1. Orientation
2. Development of hypotheses
3. Definition of terms in the hypotheses

4. Exploration of hypotheses in terms of their logical validity and internal consistency
5. Evidencing or gathering of facts and evidences
6. Formulation of generalizations

Michaelis' Inquiry Model

1. Defining the problem
2. Stating the hypotheses or questions to guide the study
3. Collect or gather the source of information
4. Analyze and synthesize the data n the sources
5. Organize the findings to answer the questions and to test the hypotheses
6. Interpret findings in relation to social, economic and political development

Note: An analysis of the aforementioned inquiry models will show that a number of inquiry process skills are built-in in each model such as:

- identification of the problem
- defining the problem
- clarifying the issues
- formulating hypotheses
- planning and developing learning activities
- gathering data/gathering of facts and evidences
- analyzing and synthesizing the data gathered
- comparing and contrasting
- organizing and writing the report
- reporting
- organizing the findings to answer the questions
- testing the hypotheses
- generalizing
- giving conclusions

3. Teachers are advised to modify certain models in using the inquiry models. Likewise, they are free to select the process skills that will fit in the development of the lesson.

B. Valuing Process Skills

Most of the lessons in social studies have built-in structures for the development of valuing process skills. However, the following can help the teachers to unfold lessons developing valuing process skills.

1. Identify the concepts/topics in the curricular offerings where the valuing process skills could be developed in the unfolding of the lessons.
2. Study how each of the following valuing models could be utilized by the social studies teachers in the elementary and secondary schools:

Beyer's Moral Discussion Model

Part I	:	Presenting the dilemma
Part II	:	Create a division on action
Part III	:	Organize a small group discussion
Part IV	:	Guide a class discussion
Part V	:	Closing the discussion

Rath's Valuing Model

Phase I	:	Choosing	1. Choosing from alternatives
			2. Choosing after considering the consequences
			3. Choosing freely
Phase II	:	Prizing	4. Considering what one prizes and cherishes
			5. Affirming one's choice publicly to others
Phase III	:	Acting	6. Acting in terms of one's choice
			7. Doing repeatedly as a pattern in one's life

Michaelis' Strategy for Clarifying Feelings

1. Recall and clarify the event
2. Infer possible feelings
3. Infer other possible feelings
4. Infer the feelings of other persons
5. Relate to experiences of students

Note: The following valuing process skills are common in any of the valuing models for the social studies:

- presenting the dilemma/conflict
- becoming aware of the problem
- defining terms
- choosing solutions from alternatives
- considering the consequences of one's choice
- collecting relevant facts to support one's decision
- clarifying the use of value criteria in making decisions
- inferring the feelings of others
- considering ways of resolving conflicts
- acting in terms of one's decision

Teachers are free to arrange on their own the sequencing of the valuing process skills that will fit best a valuing lesson in social studies.

4. Illustrative Examples

To orient the teachers on the utilization of the inquiry models and valuing models with the intent of developing the process skills in social studies the following could be done during the pre-service and in-service training programmes:

1. Give *lectures* that will establish the dichotomy of the process skills in *inquiry* vs the process skills in *valuing*. Give typical examples for each one.
2. Give a *demonstration* lesson utilizing the different inquiry models as expounded by the different social studies educators. Identify the similarities and/or differences in the unfolding of the various models.
3. Choose a lesson in social studies in the lower primary level. Use *role playing* in the development of the lesson. List down the process skills developed in the lesson.
4. Present a *simulation* to the high school students about the economic processes utilized by various nations in the world. Identify the process skills developed during the lesson.
5. Brainstorm on the topic "Inquiry Approach vs Valuing Approach to Instruction in the Social Studies". Make a list of the process skills that can be developed during the learning process.
6. Ask the student teachers/teachers to prepare their own unit of instruction/lesson plans. Then ask them to list the process skills developed in the unit/lesson.

MEGA-TREND IN CURRICULUM REFORM NO. 5 : MEETING THE NEEDS OF THE INDIVIDUAL

1. Mega-Trend

There are many domains of development in the individual, including the intellectual, emotional, spiritual and physical. These domains are highly interconnected. In order that the individual can be developed to become a well-rounded and balanced personality, proper emphasis has to be given to each of these domains.

The school curriculum (including activities outside of the classroom) has to be designed such that all these domains are developed. No doubt certain subjects would focus more on particular domains, e.g., mathematics on the intellectual domain or religious education on the spiritual domain, but in all subjects many domains can be incorporated, e.g., in teaching mathematics the inculcation of values can be done at certain instances.

While the teacher teaches his subject, he has to bear in mind that his primary function is to develop the whole individual. Hence, it is necessary that he integrates, wherever possible, knowledge, values and skills from the other subjects.

2. Teacher Competencies

In order to achieve the above goal, teachers need the possess the following competencies:

1) Recognize that the child has many domains of development and to understand the interaction between these domains:
   - ability to identify the different domains and the features of development/behaviour of each domain.
   - aware of the close interconnection of these domains.
2) Recognize that development occurs at different rates and at different times:
   - aware of the stages in the development of each domain.
   - aware that the rate of children's development of each domain differ.
3) Create appropriate learning situations in the light of Nos. 1 and 2:
   - integrate the development of a number of domains in all learning situations.

4) Develop evaluation methods that accommodate the holistic nature of the child:

   - aware of the need to assess the development of the different domains.
   - use appropriate modes of assessment for the different domain.

3. Strategies for Developing Competency No. 2

By means of Lecture – Discussion – Demonstration:

1) Lecture and discussion on the need to integrate many domains in any learning situation.
2) Watch learning situations on video to produce:
   a) a list of activities and the domains that are being developed directly and indirectly
   b) suggest how certain activities can be modified or others added in order to strengthen the development of particular domains
   c) suggest other activities appropriate to the learning situation that can develop additional domains.
3) Group work to look at existing lesson plans and to identify the domains being developed.
4) Individual or group work to prepare lesson plans with special attention to be given to the domains being developed.
5) Use the lesson plans for peer group teaching/micro-teaching/teach in a lab school.
6) After getting feedback and discussion the lesson plan to be improved.
7) The improved lesson plan to be put into practice and to note the improvements.

4. Illustrative Example

Preparing a plan for local geography for first year secondary level on the topic: *The Transport System in My Locality*

	Activities for the Learner	*Domains being Developed*
1)	Individually: collect materials on the topic from the school library and home	Directly – intellectual Indirectly – values, e.g., self-reliance, perseverance
2)	Individually: study materials and take notes	Directly – intellectual Indirectly – personality trait, e.g., self-confidence
3)	In groups: plan for field work - objective of field work - types of information to collect - means of collecting information - system/format of recording information	Directly – intellectual Indirectly – social skills, e.g., how to work as a member of a team
4)	In pairs or small groups: Carry out field work - observe and record information - interview relevant people and record information	Directly – intellectual Indirectly – social skills, e.g., interacting with people
5)	In groups: assemble information gathered and present in the form of map/graph/chart/essay	Directly – intellectual Indirectly – social skills, e.g., respect for other people's ability
6)	As a class: presentation of assembled material to the class by the representative of each group	Directly – intellectual Indirectly – social skill, e.g., willingness to become leader or follower at appropriate times
7)	As a class: discussion of issues and problems and what can/ought to be done, e.g., poor roads that need improvement	Directly – intellectual Indirectly – values, e.g., concern for the well-being of members of the community

MEGA-TREND IN CURRICULUM DEVELOPMENT NO. 6 : MEETING THE NEEDS OF DISADVANTAGED POPULATION GROUPS

1. Mega-trend

The commonly acknowledge generative sources of disadvantage are such contingent factors as birth (in a race, caste, sex); geographical, cultural, social and economics factors. Learners who are considered as disadvantaged comprise: those who come from very low socio-economic and poverty groups, those who live in rural areas, forest and hilly areas, children from urban slums, nomadic groups, tribes aboriginal children and those who belong to minority linguistic and ethnic groups.

Those learners from disadvantaged population groups have some difficulties and limitations to learn in the "normal situation". However, educational quality can be the degree or the extent to which education helps children in the maximal realization of their individual potentialities and contributes towards the social good.

One of the main thrusts of this mega-trend of curriculum reform is that of maximizing the full potential of each child regardless of their socio-economic and cultural characteristics and background.

2. Teacher Competencies:

With reference to performance in school tasks, while the disadvantaged come to the school with initial handicaps, they carry with them certain strengths as well. For example, children come from poverty section are found to have weaknesses in low verbal and language ability, weaknesses of certain cognitive functions which are necessary for formal learning, low self-image and lack of self-confidence, low ability in symbolic thinking. On the other hand, they may have some strengths such as high degree of motor skills and psychomotor competence; high sense of responsibility, reliability, self-reliance.

A proper understanding of the learner from disadvantaged population groups would involve giving due recognition to and appreciation of what the child is, and is not, good at doing in the light of the requirement of school tasks. Then the teacher should utilize and incorporate of both the strengths and weaknesses of the disadvantaged learner from disadvantaged population groups in all educational actions.

For the purpose of understanding and maximizing the full potential of learner from disadvantaged population groups, the teacher should have the ability to:

- diagnose the needs of each learner in term of socio-economic, cultural, physical, cognitive and other affective characteristics.
- identify and appreciate the benefits and limitations of the characteristics of disadvantaged children and the implications at these for the choice and implementation of appropriate learning/teaching methods and materials.
- identify strengths and shortfalls and to then mobilize and enhance the strengths and compensate for the shortfalls.

3. Strategies for Teacher Training

The following may be considered as the way to build up these competencies in teacher education.

1. For pre-service programme, the curricular inputs into the preparation of a teacher should put more practicum experiences in the programme. Courses in curriculum and methods become more than lecture courses – they are a combination of theory, method and practice. Direct observation of competent, co-operating teachers or master teachers is recommended. Resource centres and demonstration class might be useful.
2. For in-service programme, variety of courses (short and long term courses) are made available. The variety of delivery may be used: such as radio, T.V., and correspondence, also outreach programmes through non-formal education etc.
3. Technical resource support, based on research and development, need to be made available to teachers on a large scale.

4. Illustrative Examples

Diagnosis is to gather pertinent information concerning a specific child and to analyze and synthesize the information in making the crucial decisions about teaching.

Disadvantaged children are a heterogeneous group. The wide range of both degree and types of disadvantaged required a diversity of approaches and of diagnostic techniques. The following steps are essential in making diagnosis.

1. Determine the child who has special needs.
2. Measure the child's present achievement to detect the specific areas of failure and the levels that appear to be blocked.
3. Analyze how the child learn, and why the child does not learn.
4. Formulate a diagnostic hypothesis and point the ways for educational planning.

5. Develop a plan for teaching in the light of the hypothesis. The plan should specify areas of the child's strengths and weaknesses. The strategies for teaching should include plans to teach through areas of strength while helping to develop and build deficient areas.

The diagnosis is continuous and must be revised and modified as more knowledge of the child is acquired through teaching and as the student change through learning.

Data for diagnosis can be obtained in various ways. There are:

1. a case study or interview
2. observation
3. informal testing
4. formal standardized testing.

Then, for training teachers to this competency, knowledge of and skills to make diagnosis of the needs of learners from disadvantaged population groups should be the integral part of pre-service training as well as in the programme of in-service training.

MEGA-TREND IN CURRICULUM REFORM NO. 7 : LEARNER-CENTRED TEACHING AND LEARNING

Learners Ideas and Explanations

1. Mega-trend

In the further interpretation and enrichment of the relevance of the curriculum for the individual, and the enhancement of the learner-centredness of the learning situation, recently, in several countries, serious attempts have been made regarding the designing of the episodes for the facilitation of learning, relevant to and taking off from, the learners own background of facts, concepts, skills attitudes and other attributes. This also takes into account that learners are not only "observers" but "theorists" as well, who develop their own principles and concepts to "explain" their observations. These may or may not converge with principles and concepts of say "standard" science. Such a consideration enlarges the recognition of "entry behaviour" beyond what a learner brings into the learning situation merely looked at against the criteria of the pre-determined intended learning outcomes of the lesson, to the entire range and scope of the child's available "storehouse" of knowledge, skills attitudes, and social competencies, all of which form a rich basis for further learning.

2. Teacher Competencies

Among the many teacher competencies associated with learner-centred facilitation of learning, an important new competence, recently being stressed, is the recognition by the teacher, of the learner's own ideas and explanations (such as about natural or scientific phenomena), and associated with this, the competence to find out what these learner perceptions are.

3. Strategies for Teacher Training

Two strategies are indicated in the illustrative example (from a Study Guide of the Palmerton North, New Zealand, Teachers College – Science in the Classroom Unit 05.30).

The first is that it is a co-operative (with study partner) self-learning module, written in an adjunct programme mode; and second, the teacher competencies are developed through direct empirical experience obtained by the teacher trainee.

4. Illustrative Example

Strategies for Teacher Training

When taking a child to an intellectual excursion, it is necessary to start *where the child is, not where the teacher is.* A basic first step of the strategy therefore is to know where the child is – what prior knowledge, skills and attitude he has. This could be

done through a diagnostic test, interview of the child, his former teachers, if any and of his parents. The knowledge portion could be assessed through a diagnostic test. The skills and attitude of the child may be determined through interview.

An important second step is to determine the child's strengths and weaknesses. A mistaken notion is that a child from disadvantaged population group has only shortcomings, which is farthest from the truth. A child from population disadvantaged group is usually imbued with many desirable behaviour traits such as high sense of responsibility, survival skills, manipulative skills, etc. In a learner-centred teaching-learning approach, the teacher will build on these strength, rather than turning them off by focusing on their disadvantageness.

Illustrative Example

A case study of two teachers in a remote village school is presented here.

Teacher *A* is from the town centre. She comes to the village just before classes start and goes home immediately after school hours. During the rainy season, almost every day, she is furious with her pupils who come to class with mud on their legs, arms and clothes. She then calls their attention to a slogan prominently displayed in front of the classroom, which reads "Cleanliness is next to Godliness". Many pupils stop going to school, as they feel guilty not only of being unclean but of being un-godly.

Teacher *B* lives in the village. She understands why pupils come to school with mud on their legs, arms and clothes. During rainy season they pass through water buffalo trails. She cuddles children, talk to them and spend time knowing every child. She visits the children's homes and interview their parents. She then gets to know about the strength and shortcomings of each child. She makes it a point to build on their strength. She found out for example that one boy was responsible for three water buffaloes, which is 50 per cent of the wealth of the family. She therefore made him as class monitor, which enhanced the child's ego, and subsequently his learning achievement spurted.

Among the shortcoming of the children in her class, is their inability to verbalize and conceptualize using the national language and English. Teacher *B* therefore studied hard to learn their dialect. Using the vernacular, she leads them to learn better, including the national language and subsequently English.

Teacher *B* is not teaching the subjects. She was facilitating the children's learning of the different subjects. She is seldom in front of the room. The children are at the heart of the learning process. The prescribed books provide them theoretical learning but she made sure such learnings are applied in real life – not the life of the authors of the book, nor of the teacher but those of the children and their parents.

To Teacher *B*, child-centred learning also means that what children learn in school are pass on to their parents, especially those who hardly had any education. The children are at the centre of new learning in the home as well. A young boy taught his father how to make fertilizer by making and operating a compost pit. A young girl taught her mother how to cook vegetable properly.

MEGA-TREND IN CURRICULUM REFORM NO. 8 : MASTERY LEARNING[2] FOR GENERAL CLASSROOM SITUATION

1. Mega-trend

(a) Rationale

Despite great advances in knowledge about student learning, schools still have not moved very far toward the goal of increased learning for all students. Schools continue to produce successful and rewarding experiences for only one portion of our learners. We cannot afford to allow one, let alone a majority, of our students face 6 to 9 years of unsuccessful and unrewarding school learning experiences. Such experiences limit an individual's chances for economic survival and security in the world of work. He is unlikely to acquire the basic skills or attitudes required for a job which can secure him a decent standard of living. School learning failure link also with his personality development. Failure to meet the school's learning requirements tends to cause the development of a negative self-concept. Mastery learning offers a powerful new approach to student learning which can provide almost all students with successful and rewarding learning experiences now allowed to only a few. It proposes that almost all or all students can master what they are taught. Further, it suggests procedures whereby each student's instruction and learning can be so managed, within the context of ordinary group-based classroom instruction, as to promote his fullest development. It also makes student learning more efficient than conventional approaches. Because of these effective attributes, mastery learning has been identified as an important component of curriculum reforms.

(b) Procedure for Mastery Learning

There are a number of approaches of learning for mastery. These approaches shared many major features as follows:

First, mastery was defined in terms of particular educational objectives each student was expected to achieve. The objectives could be cognitive, or affective, or psychomotor or combination.

Second, instruction was organized into well-defined learning units. Each unit consisted of a collection of learning materials systematically arranged to teach the desired unit objective or objectives.

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2 Adapted from Block, J.P. *Mastery Learning: Theory and Practice*, Holt, Rinehart and Winston, Inc. New York, 1971.

Third, complete mastery of each unit was required of students before proceeding to the next. This feature was especially important because units tended to be sequenced so that the learning of each unit built upon prior learning.

Fourth, an ungraded, diagnostic-progress test was administered at the completion of each unit to provide feedback on the adequacy of the students learning. This test either indicated unit mastery, and thus reinforced his learning or it highlighted the mastery he still need to master.

Fifth, on the basis of this diagnostic information, each student's original instruction was supplemented with appropriate learning correctives so that he could complete his unit learning.

Finally, time was used as a variable in individualizing instruction and thereby in fostering student learning mastery.

2. Teacher Competencies Required for Applying Mastery Learning

In order to realize the goal of mastery learning, teachers need to be proficient in applying mastery strategies to their classroom situation. The following teacher competencies are required to contribute to application of the mastery learning approach:

(a) Ability to facilitate initial learning, reinforcement of learning and the application of learning.

(b) Ability to provide for prevention of learning difficulties.

(c) Ability to provide for remedial teaching.

3. Strategies for Teacher Training

To develop the identified competencies for teachers, either the prospective or the current ones, the following strategies are recommended:

(a) Classroom observation.

Teachers who can be good models for applying the concept of teacher as facilitator for learning, are selected. The trainees then observe those teachers' performances in the classroom. The trainees will write up the report comparing what they have seen from classroom and what they have learned from the theory of facilitating learning. An instruction will be provided for the trainees to observe certain elements that vital for being a learning facilitator, e.g. how to cope with the talented and slow learners in the class; how to provide a remedial lesson to those who need it.

(b) Experiment

The trainees at this stage will be playing the roles of the regular teachers. To master the concept of mastery learning, they will first select a lesson of any grade they want. Secondly, breaking down the selected lesson into the well-defined small units. Thirdly, for each unit, the unit objectives will be formulated in measurable term.

Fourthly, they need to develop the diagnostic test for each unit. Finally, the trainees themselves will teach the class by fully applying the concept of mastery learning together with the unit objectives and the test that has been developed. The procedure will be repeated, if needed, until trainees acquire the identified competencies.

4. Illustrative Examples

To master the competencies required for effectively applying the concept of mastery learning, the following activities for teaching/learning of the trainees are essential:

(a) The trainees will be assigned to write a paper on the role of teachers as facilitators. They will be required to cover at least 4 components; the concept of mastery learning, facilitation of learning, coping with the learning difficulties and remedial teaching. Materials, textbooks and related literatures on the topics will be arranged for their research.

(b) Bearing in mind the four components, trainees then observe the classroom situation. They will be asked for comparison between what they have learned from their research papers and the real classroom situation. At this stage, trainees will learn more effectively if teachers who have the required competencies are selected as models.

(c) Trainees will be required to practice the procedures for applying the mastery learning concept. The following steps are employed:

(1) Selection of a lesson of any class that they want to try out.

(2) Formulate the general objectives for the selected lesson. At this point, trainees will be trained to write an objective which will focus on measurability on the expected output.

(3) The content of the lesson will then be broken down into the small well-defined units arranging in a logical sequence.

(4) For each unit, the specific objective will be formulated by the trainees. Elements in writing the specific objective will be focused for the task; time frame, target population, behaviour, criterion and etc.

(5) The diagnostic test for each lesson unit will also be constructed by the trainees. Reliability and validity of the test are the main focus for developing such a test.

(d) An experimenting exercise will begin at this stage by trainees themselves playing a full role as teachers applying all materials they have developed. The following questions will be kept in mind during and after the experiment session:

(1) Can trainees be effective facilitators?

(2) How effective they are in coping with the difficulties of some students?

(3) Is remedial teaching applied properly to help those students who need help?

(4) How much ability do the trainees acquire in organizing the lesson content into well-defined units?

(5) Are trainees able to formulate both general and specific objectives adequately?

(6) Are trainees able to construct the diagnostic test for each lesson unit adequately?

(7) Do trainees follow the whole procedure for applying the mastery learning concept effectively?

(e) A follow-up seminar is recommended to be held among the trainees and the trainers in order to discuss as to how application of mastery learning can be better improved.

MEGA-TREND IN CURRICULUM REFORM NO. 8 : MASTERY LEARNING IN MATHEMATICS AT PRIMARY LEVEL

1. Mega-trend

The recognition that enrolment and even prevention of drop-out and repetition are necessary but incomplete attributes of an effective education system has emphasized the importance of superior achievement by learners, and hence the significance of many countries specifying the goal of *mastery learning.* In the cases where a minimum learning set of outcomes has been defined (especially for Education for All), the need for mastery has been further highlighted.

2. Teacher Competencies

Associated with mastery learning are a number of teacher competencies, which are generally based upon the triad of overall operations of learning stages a student moves on the journey towards mastery, i.e. initial learning; reinforcement of learning; application of learning. In this example, special attention is being provided to competencies for reinforcement of learning.

3. Strategies for Teacher Training

Curricular reforms at primary level, in the region, have produced significant progress in the *initial* learning of concepts and principles in many subject areas. Most new curricula have excellent specifications for learning sequences that would assist the young learner being introduced to a new concept or principle.

However, the next important pedagogical operation in the learning process, of reinforcement of learning after the initial learning, has remained somewhat underdeveloped.

Thereby, stability and secure internalizing of the learning has not been assured, increasing the risks of not reaching mastery learning, and of making the application and transfer of learning to real life situations, unstable and difficult.

Further, the danger of the accumulation of learning difficulties increases because of the paucity of stability in, and mastery of, the initial learning.

Attempts made for the reinforcement of initial learning, frequently became boring "drill" sequences, especially in mathematics, that ran the risk of demotivating

the learners, at a critical time in the establishment of their learning. Yet practice is *essential* for stabilizing initial learning.

Mathematical games, which involve the excitement of curiosity and discovery, could become an alternative to the routine drill and practice.

Further, in a joyful manner, introduction may be made to higher order cognitive operations like inquiry, recognizing patterns, and hypothesis making and testing.

In this respect, mathematics lends itself well for the purpose, because of "unique" answers that are precise, thereby not confusing the young learner at primary level with alternatives and approximations when testing hypotheses. Issues of precision in testing hypotheses are of great importance at secondary level, but would tend to distract the child at the primary level (in particular lower primary level), from the process of scientific inquiry. Also the level of mental development of the child at this level would not permit the child to deal with the several parameters that will be associated with the issues of precision.

In the region, there are already in use, a number of games (especially those related to mathematics, science, population education, environment education, logic). These are, however, generally focused upon secondary level learners. Very few games are available for the primary level, especially for the lower primary grades, where foundational learning of basic concepts and principles are of prime importance.

The mathematical games that follow are to be used by teachers with their pupils. They have been developed as a medium for stimulating *reinforcement* of learning, by providing for "drill" and "practice", but without demotivating the young learners. They are also a medium for inquiry methods, recognition of patterns and relationships, and hypothesis making and testing.

These games have been field tested with a variety of learner populations in different environments, including with children in refugee camps in Thailand. The interest of learners was found to be very high, and the "drill" function was achieved smoothly and with joy. The games were most frequently used in the mode of inquiry as guided discussion, in which the learners confronted the "problem" in a game (e.g. what patterns?); acquired the knowledge base related to elements of the problems; analyzed the relevant relationships or patterns; generated ideas; selected the most appropriate ideas; and tested them.

The games indicated below have been chosen for their quality of being open-ended, in that when the "design" of the game is identified, teachers can develop scores more on their own, in every case. Thereby, hopefully, the "ownership" of the games will pass on to the teachers and through them to the *learners*, and teachers will be stimulated to produce games for other areas of mathematics at primary level.

Indeed it is *expected* that the learners themselves will learn the "design tricks" and generate their own games, thereby establishing not only joyful intellectual stimulation, but also sustained intellectual self-volition as well.

The development of such games in teacher training assists in concretizing the concept of reinforcement, and enhances creativity and divergent thinking on the part of the teacher trainee herself.

4. Illustrative Examples

Mathematical Games for Primary Level

Set I - Addition and Subtraction

	(a)	(b)	(c)	(d)	(e)
(i)	01	02	03	04	05
(ii)	06	07	08	09	10
(iii)	11	12	13	14	15
(iv	16	17	18	19	20
(v)	21	22	23	24	25

Construct a matrix such as above.

1. Look at Column (a) [i.e. (a),(i),(ii),(iii),(iv),(v)]. By how much is: (a),(ii) greater than (a),(i)? (a),(v) greater than (a),(iv)?

   Does this pattern apply to the whole Column (a)?

   Does this pattern apply to other Columns [i.e. (b),(c),(d),(e)]?

   Will this pattern be true, if the matrix is expanded beyond 25?

2. Mark the even numbers in Columns (a) and (b). What pattern appears?

   Does this pattern apply to adjacent Columns taken in pairs [i.e. (b),(c); (c),(d); (d),(e)] ?

   Will this pattern be true if the matrix is expanded beyond 25?

3. Mark the numbers divisible by 3 without a remainder.

   What pattern appears?

   Will this pattern be true when the matrix is expanded beyond 25?

   Are there other patterns when numbers divisible by other numbers, without a remainder (such as 4 or 7 or 11, etc.), are identified.

4. Look at Column (a), i.e. 01
   06
   11
   16
   21

Does the second digit down the column show a pattern?

Does the first digit down the column show a pattern?

If the matrix is extended beyond 25, are these patterns still visible?

Is this pattern seen in other Columns?

For the other Columns too, are the patterns visible if the matrix is extended beyond 25?

5. Look at Row (iv) and (v).

   Add the second digit of each number in Row (iv) to the first digit of the leftwards diagonal number in Row (v), i.e. 7 (of 17) + 2 (of 21).

   What pattern is visible?

   Is this pattern seen in other Rows?

   Are these patterns visible if the matrix is extended beyond 25?

   Are patterns seen if A the same operations are done on the rightwards diagonals?

   Are patterns seen if the first digit of each number in Row (iv) is added to the second digit of the leftwards diagonal number in Row (v)?

   Are patterns seen if the same operations are done on the rightwards diagonals?

6. Add all the numbers in Column (a), and in Column (b), and in Column (c) and so on.

   Do the results form a pattern?

   If the matrix is extended beyond 25, would the pattern remain?

7. Add all the numbers in Row (i), and in Row (ii), and in Row (iii) and so on.

   Do the results form a pattern?

   If the matrix is extended beyond 25 would the pattern remain?

8. (a),(i) - (b),(i) = 4
   (b),(iv) - (c),(iii) = 4
   (d),(iii) - (e),(ii) = 4

   Is this (rightward) diagonal pattern true for the whole matrix?

   Will it be true if this matrix is expanded beyond 25?

9. (b),(ii) - (a),(i) = 6
   (d),(iv) - (c),(iii) = 6

Is this (leftward) diagonal pattern true for the whole matrix?

Will it be true if this matrix is expanded beyond 25?

10. (a),(iii) - (b),(i) = 9
    (c),(iv) - (d),(ii) = 9

    Is this (rightward) diagonal pattern true for the whole matrix?

    Will it be true if this matrix is expanded beyond 25?

11. (b),(v) - (a),(ii) = 11

    Is there a (leftward) diagonal pattern?

    Is this true for the whole matrix?

    Will it be true if this matrix is expanded beyond 25?

12. (a),(v) - (b),(i) = 19

    Is there a (rightward) diagonal pattern?

    Is this true for the whole matrix?

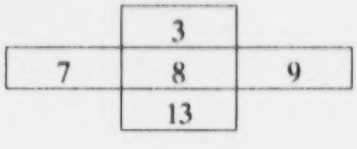
    Will it be true if this matrix is expanded beyond 25?

13. What other diagonal patterns are waiting to be discovered?

    Are these true for the whole matrix?

    Will these patterns be true if this matrix is expanded beyond 25?

14. Mark the figure (a cross), in the matrix which includes 3,7,8,9,13



    3 + 8 + 13 = 24
    7 + 8 + 9 = 24

    What is the pattern?

    Are there other crosses that give similar patterns?

    Are there patterns across the cross patterns as well?

    Are there other figures (than crosses) that will also give patterns?

    Will these patterns be true if this matrix is expanded beyond 25?

15. In the subtractions such as (a),(ii) - (b),(i), etc. (rightwards diagonal) the result was *4*.

    In the subtractions like (b),(ii) - (a),(i), etc. (leftwards diagonal) the result was *6*.

The first row of the matrix ends in *5* .

Is there a pattern 5 - 1 and 5 + 1 for a matrix whose first row ends in 5?

If the matrix ends in 6, such as:

1	2	3	4	5	6
7	8	9	10	11	12
	etc.			etc.	

is there a pattern in the diagonal patterns such as 6 - 1, 6 + 1 ?

Would this apply to other matrices whose first row ends in other numbers such as:

1	2	3	4	5	6	7		or	
1	2	3	4	5	6	7	8	9	etc. ?

Mathematical Games for Primary Level

Set II – Multiplication and Division

X	12	11	10	9	8	7	6	5	4	3	2	1
1	12	11	10	9	8	7	6	5	4	3	2	1
2	24	22	20	18	16	14	12	10	8	6	4	2
3	36	33	30	27	24	21	18	15	12	9	6	3
4	48	44	40	36	32	28	24	20	16	12	8	4
5	60	55	50	45	40	35	30	25	20	15	10	5
6	72	66	60	54	48	42	36	30	24	18	12	6
7	84	77	70	63	56	49	42	35	28	21	14	7
8	96	88	80	72	64	56	48	40	32	24	16	8
9	108	99	90	81	72	63	54	45	366	27	18	9
10	120	110	100	90	80	70	60	50	40	30	20	10
11	132	121	110	99	88	77	66	55	44	33	22	11
12	144	132	120	108	96	84	72	60	48	36	24	12

1. Look at the "11 times" Column (or Row).

   Is there a pattern in the change in the last digit?

   How does this pattern compare with that in the "9 times" Column (or Row)?

2. What are the patterns in the change in the last digit in the:

   "12 - times";
   " 8 - times";
   " 6 - times";
   " 7 - times";
   " 4 - times", Column (or Row)?

   What other last digit patterns are visible?

3. What are the patterns in the first digits in the various "times" Columns (or Rows)?

4. In the "9- times" Column (or Row), add the digits down the table, such as $9 \times 2 = 18$ $1 + 8 = 9$
   $9 \times 7 = 63$ $6 + 3 = 9$

   Is there a pattern throughout the Column?

   Is there a breakdown in the pattern, and if so where?

5. In the "9 - times" Column (or Row) look at the first or 10's place digit, i.e. 1 in 18 or 3 in 36. How does this change over the Column (or Row)?

   Is there any break in the pattern, and if so where?

6. In the "9 - times" Column (or Row) look at 18. The first digit is 1 and the next is 8 or 9-1 = 8.

   In 27, it is 9 - 2 = 7.

   Is this a pattern in the "9 - times" Column (or Row)?

   Is there a break in the pattern, and if so where?

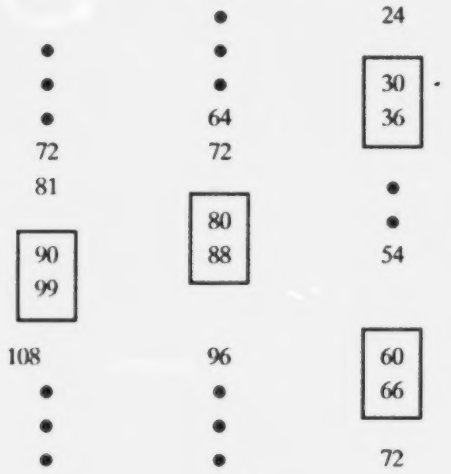
7. Look at the "8-times" Column (or Row) and as with the "9-times", add the digits, such as:

   $8 \times 2 = 16$ $\quad 1 + 6 = 7$
   $8 \times 4 = 32$ $\quad 3 + 2 = 5$

   What pattern is visible in the addition product down the Column (or Row)?

8. In the "9-times" and 8-times Columns (or Rows), are there any other patterns?

9. When "0" is in the second unit digit,
   what is visible, across the whole set of Columns (or Rows) regarding the first (tens) digit, such as:



10. Are there additional patterns visible after meeting "0" in the second digit for "4", "3", "2" times Columns (Rows)?
11. Over the whole multiplication table, how many patterns are visible?
12. Look at the following multiplications:

15 x 15	=	225
25 x 25	=	625
35 x 35	=	1225
45 x 45	=	2025
55 x 55	=	3025
65 x 65	=	4225
75 x 75	=	5625
85 x 85	=	7225
95 x 95	=	9025

Are the last two digit always 25, however far this pattern of multiplication is extended?

Is there a pattern down the 100's place digits, i.e. 2,6,2,0, etc.?

If so, would the pattern be present if the set is extended?

Is there a pattern down the 1000's place digits, i.e. 1,2,3,4, 5,7,9.

If so, would the pattern be present if the set is extended?

Take 25 x 25 = 625 as an example. The first digits (of 25 x 25) are 2.

The first digit in the product is 6, i.e. (2x2 + 2) = 6,

and 25 is always repeated in the last two digits, hence the product is *625*

65 x 65

6 x 6 + 6 = 36 + 6 = 42
hence the product is *4225* ,

Does this pattern apply to any such multiplication, such as 105 x 105 or 185 x 185, etc.?

13. What patterns are visible in the digits of the products of the following multiplications?

(i)	34	x	3	= ?	(ii)	91	x	11	= ?
		x	6	= ?			x	22	= ?
		x	9	= ?			x	33	= ?
		x	12	= ?			x	44	= ?
(iii)	99	x	11	= ?	(iv)	41	x	3	= ?
		x	22	= ?			x	6	= ?
		x	33	= ?			x	9	= ?
		x	44	= ?					
(v)	77	x	13	= ?	(vi)	143	x	7	= ?
		x	26	= ?			x	14	= ?
		x	39	= ?			x	21	= ?
(vii)	37	x	3	= ?	(viii)	149	x	29	= ?
		x	6	= ?			x	58	= ?
		x	9	= ?			x	87	= ?
(ix)	101	x	23	= ?	(x)	101	x	11	= ?
		x	46	= ?			x	22	= ?
		x	69	= ?			x	33	= ?
(xi)	101	x	7	= ?	(xii)	101	x	19	= ?
		x	14	= ?			x	38	= ?
		x	21	= ?			x	57	= ?
(xiii)	776	x	7	= ?	(xiv)	79	x	23	= ?
		x	14	= ?			x	46	= ?
		x	21	= ?			x	69	= ?
(xv)	194	x	11	= ?	(xvi)	65	x	19	= ?
		x	22	= ?			x	38	= ?
		x	44	= ?			x	57	= ?

14. Are the patterns continued however far the multiplications are taken?

15. What patterns are visible in the digits of the products of the following multiplications?

(i)
$$1 \times 2 = ?$$
$$11 \times 2 = ?$$
$$111 \times 112 = ?$$
$$1111 \times 1112 = ?$$

(ii)
$$2 \times 3 = ?$$
$$22 \times 23 = ?$$
$$222 \times 223 = ?$$
$$2222 \times 2223 = ?$$

MEGA-TREND IN CURRICULUM REFORM NO. 9 : HOLISTIC/PERFORMANCE EVALUATION

I. Mega-trend

The whole child development in contexts that are themselves holistic was a primeval oriental pedagogical strategy of learning *in* life *for* life, in personal contact and interaction with a Guru. This was lost when countries in the region adopted, or were forced to adopt, the more primitive "Western" models of education, of segmenting the learner, which have now ironically been termed "traditional" because of their use for about a century in the region. A return to the primeval holistic pedagogical strategy is a "new" trend, but in fact is really a phoenix reborn out of the failure fires of the segmented model, especially for functionality.

Correspondingly, *evaluation* of achievement by the learners, it is again recognized, must also reflect *consistently*, the *holistic* parameters, even though some of the elements in the evaluation must necessarily need to be judgmental, and the evaluation itself multi-dimensional.

2. Teacher Competencies

The teacher has to establish consistency between the holistic learning situation (where all domains of the child's development are nurtured, and this in holistic learning situations which lend themselves to the nurturing, if possible simultaneously, of all the domains of development), and the evaluation of the growth in the domains.

Such a general competence requires to "tag" the potential elements in a holistic situation, that facilitate the development of the various domains, and evaluate the achievement of growth acquired by the learner. As preparation for such evaluation, prerequisite teacher competencies are required in the effective evaluation of the various individual domains (such as the cognitive or the affective).

3. Strategies for Teacher Training

Among the strategies usable for this purpose, the following provides a possible design structure:

- immersion in several holistic learning situations, such as from real life (case studies; simulations; actual);
- analysis of these situations for recognizing potential involvement of the various domains separately and interactively;

- shunt competency and proficiency development for the design and construction of instruments to evaluate the growth in the different domains;
- immersion in several holistic learning situations for application of appropriate domain-specific evaluation instruments (case studies; simulations; actual);
- application of above to real classroom situations as a component of practice teaching, in classroom and out-of-classroom situations.

4. Illustrative Examples:

Case studies, simulations and actual holistic learning situations such as:

- interventions for improving the quality of life in the village;
- socio-economic development issues;
- survival/environmental protection issues;
- inter-personal conflict situations;
- personal development issues.

These holistic situations would incorporate the cognitive (discipline/non-discipline content, at various levels of cognition); psychomotor (fine/gross at various levels of proficiency); affective (related to personal, social, aesthetic, spiritual, at various levels of involvement).

MEGA-TREND IN CURRICULUM REFORM NO. 10 : COPING WITH/MANAGING CHANGE : COPING COMPETENCIES

1. Mega-trend

Competencies for coping with events of life and toil have been foundations of curriculum development (specification of intended learning outcomes; modes and methodologies for achieving these; modes and methodologies for verifying if these have been achieved) from primeval times. When the pace of change was relatively slow, the curriculum development process could provide for the required coping competencies.

As the pace of change accelerated, and, simultaneously the attributes of future events became increasingly unpredictable, the capacity of the curriculum development process to specify particular intended learning outcomes was proportionately weakened. When the specification process retained essentially the attributes of the process fitted to slow change, the resulting curricula became notoriously dysfunctional and irrelevant.

2. Teacher Competencies

In some cases, the curriculum development process attempted to meet this crisis through specifying generalizable and transferrable competencies, such as learning to learn, critical thinking, problem solving. Corresponding competencies for teachers and facilitators of learning were also attempted to be specified.

But even here, being only "tools" or "instruments" for operation, they alone were insufficient for meeting coping needs.

While retaining such instrumental competencies, the nature of the events and phenomena to be coped with, have also to be considered, in the specification of coping competencies, for learners; and in the specification of corresponding competencies, for teachers and facilitators of learning.

This would move the specification process for teacher education, beyond the *current* new competencies demanded by *present* innovations in the learning/teaching situation, because the specification will be drawn directly from phenomena and events to be coped with. Only *some* of the phenomena and events or, possibly, *some portions of some* of these have found consideration in the new curricula innovations and specifications for learners.

In particular, teacher education would need to deal with specific competencies such as the following:

- to identify that change is occurring, and the attributes of the change (pace, quality, scope, quantity);
- to discriminate among changes that need to be merely coped with and others that may be managed;
- to provide for learning sequences that achieve the above;
- to evaluate how a learner performs and to make necessary adjustments.

3. Strategies for Teacher Training

The following may be considered as types of phenomena and events that may need analyses to determine the corresponding coping competencies. Several more types would also need to be identified and analyzed.

(a) Unemployment

- Unemployment of Second Level graduates is higher than unemployment of graduates from other levels. In the late 1970's this unemployment had reached 50 per cent, and has been rising steeply ever since. It has now reached proportions that are catastrophic. For many countries, the anticipated figures in the ILO World Unemployment Survey are around 75 per cent unemployed second level graduates. Recent more detailed national studies indicate that these predictions, grim though they were already, have been too optimistic. In one large developing country in the Region, the ILO estimates have been raised from 74 per cent to 89 per cent. Simultaneously, countries are increasing enormously the production of second level graduates, by extending the first level and by having an open door policy of transition between the first and second levels.
- Struggle for adulthood is intimately related to the struggle for vocational and economic independence. The demanded vocational skills in modernizing (and modern) societies, change very rapidly. Leap frothing historical development, i.e. moving into high-tech industries, skipping intermediate stages, involves drastic reduction of manual and semi-skilled occupations. The structure and composition of employment change very rapidly, and frequently unpredictably in terms of the time scale of usual education planning (decade units).
- Social and psychological costs of the above insecurities on a robust, vocal, population that forms the future mature adult population.

(b) Conflicts

- Conflicts between competencies for living and competencies for earning a living.
- Changes in the loci of authority at micro and at macro levels, and decaying of social safety nets and social learning processes that developing coping competencies.
- At international and national levels, burdens of rival ideologies racing into confrontation and conflict. Atmospheres of animosity generated and maintained. Rivalry of groups is not new, but what is new is that technology has brought these groups too close together for comfort. Nations, often safely separated by seas, rivers, mountains, deserts, are exposed to each other by "air" via radio, TV, air travel and paratroops, which have thrown people into each other's laps. Same at micro level in the case of urbanization, and the development of artificial communities. Deterioration of competencies for human relations (ethnic, religious, caste as well as cross-national ideological conflicts).
- Focus by commercial forces, artificial enhancement of desire and greed, peer pressures in the context of a considerable proportion not having the financial capability to meet these desires and demonstration of others of the age group who have the means to meet these desires.
- New demands from adults (elders) (often via school system, such as by curriculum areas as moral education) to conserve traditional values *and* act as agents to propagate them. Yet elders provide opposite examples of these same values. Economic development models which emphasize consumerism, self-interest also contrary to traditional values, such as concern for others.
- Flood of information via electronic media specially – with no selection competencies developed, producing a range of conflicts and conflicts between conflicts.
- On the threshold of voting, (voting age frequently 18) focus of numerous political pressures, many in conflict with traditional values, and many exploiting idealism and enthusiasm of the young population.
- The partnership of two "races" – human and robotic. The very first recorded intelligent liens encountered by humankind did not come from outer space but from the inner space of human laboratories and factories. New implications of artificial intelligence such as new horizons for thinking (including utilization of the 80 of the human brain that seems to remain unutilized at present; the multiple paradox of common sense vs uncommon sense (scientific sense); intelligence amplifiers and symbiotic minds of computers implanted in the brain that can "read" and "speak"

electrochemical "language" of the brain – hence removing the need to read a book (literacy) – knowledge moving direct into the brain.

To these may be added issues such as the environment crisis; the energy crises; and the information explosion, about which, at least in some countries, work regarding coping competencies have been initiated.

The above indicates merely the vast range of significant "change" situations that *may* confront future youth, and hence may require competencies *and* proficiencies in the teacher, especially if the school takes on the role of surrogate parent more directly than at present due to drastic changes of family structures and roles.

In dealing with such diverse situations, aside from the *generalized competencies* indicated earlier (such as critical thinking), the *recognition* of *change* and the recognition of the *pace of change* are foundational to the initiation of interventions regarding coping competencies by learners, and also by the teacher trainees.

A second general component is the *analytical ability* to "see into" these changes, the implications for the individual, for the community, for the nation, and indeed for the Planet Earth. While this would be the total canvas, a start may be made in terms of scenarios of direct interaction with individuals, and then proceed to layer wider and wider perspectives to include the community, the nation and the world.

A third general component relates to the ability to *take action* in regard to the change. The designing of action would, most likely, use both logical and alogical (intuitive) techniques. Systems analyses techniques would, nevertheless, appear prominently, especially because of the need to recognize that some parameters cannot be identified. Such actions would be "corrective" of the negative effects already visible; and "preventive" of potential negative effects in the future. Both these are likely to contain short-, medium- and long-term measures.

Because of the uncertainties in the change scenarios, the actions must necessarily be seen to be *tentative*, though the best possible under available knowledge conditions. Hence a sequential set of monitoring and evaluation actions become essential, followed by further planning and action. Since reality frequently abhors the ideal, the actions must inevitably be products of "trade offs", which means that the "price" paid for the trade off must also be recognized.

The design framework referred to above is worded in the context of "coping". The same structure may also be considered if actions are intended to be *more* than the (reactive) "coping" and become the (pro-active) "managing" change. The actions involved would, of course, be significantly different. Again, in reality, the likelihood may be a hybrid of "coping" and "managing", with varying weightages according to the nature of the change being focused upon and the contexts of a given country.

4. Illustrative Examples

(To be further developed specifically)

Real life case studies on change situations specific to the locality (excess use of fertilizers and insecticides; advertising pressures; social conflicts; exploitative measures by vested interest groups; dilution of the spiritual and cultural milieu, etc.) as well as real life situations themselves in the locality regarding such changes would form the major basis for the development of "coping" and "managing" competencies.

To these may be added simulation/role-play situations, especially in regard to those issues that have more than local specific implications (say for the province or the nation or the world).

In both cases, the analysis and planning must end with *specification of action*, and in the former case, *taking action* as well, followed by monitoring evaluation and replanning of action.

Since the alogical and the trade off techniques will need to be utilized, these would be provided special attention.

Chapter Four

MEGA-TREND IN CURRICULUM REFORMS IN SCIENCE AND MATHEMATICS

After a thorough discussion of the working paper presented by the Technical Working Group, the Regional Study Group Meeting on Teacher Education split into two main working groups. Group A examined the mega-trends in curricular reforms in the natural sciences and mathematics. Group B dealt with the social sciences and languages.

Both groups used a common conceptual framework which is shown on the next page.

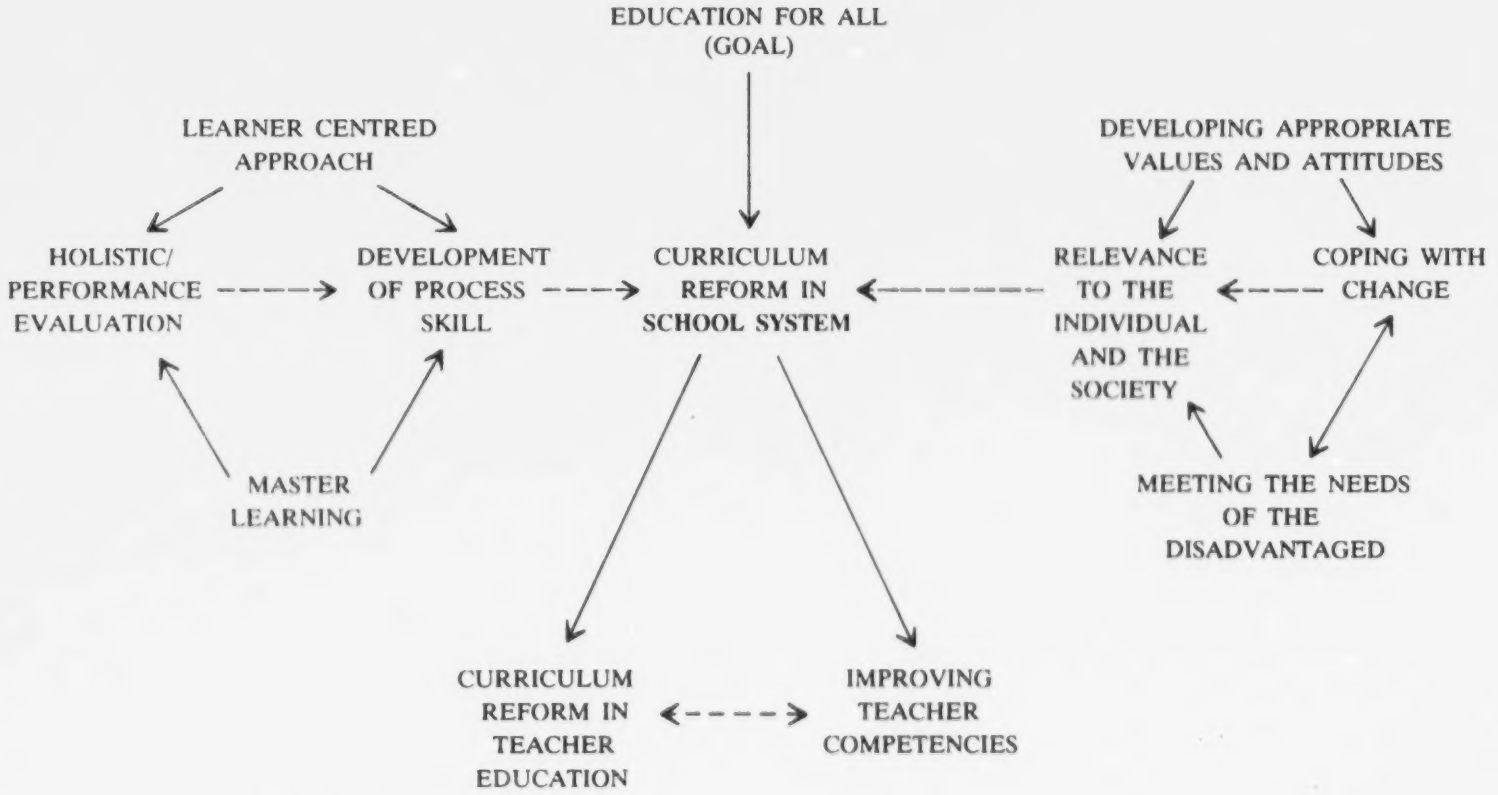
Chapter Four contains the output of Group A – Natural Sciences and Mathematics.

A. Relevance of Science Curriculum to the Individual and Society

1. Mega-Trend

Considering the rapid scientific and technological changes and the knowledge explosion taking place, a curriculum designed to provide learning of science and mathematics for all has to be formulated. Such a curriculum should seek to accommodate both the needs of the individual and society to bridge the seeming conflict between them. Emphasis should be given to the development of the individual who can think and act independently but who sees service to the community as the higher goal of his personal development. Such concerns should, therefore, involve the application and applicability of what is taught in schools not only to the short-term and long-term interests of the learners but also of the society to which he belongs as well. Likewise, it involves the selection of goals, methods and content that are of local, national, regional and universal concern, and which are relevant to the needs and problems of the individual, in particular, and the society, in general.

Present realities require that science education should be concerned with environmental management and quality of life for all. It should, however, develop in the learner not simply the broad conceptual framework of environmental science but also the values and competencies of such knowledge to day-to-day living. It should, therefore, generate in the learner both the awareness of the environmental crisis and both a commitment and capacity to act to help avert this.


EDUCATION FOR ALL
(GOAL)
LEARNER CENTRED
APPROACH
DEVELOPING APPROPRIATE
VALUES AND ATTITUDES
HOLISTIC/
PERFORMANCE
EVALUATION
DEVELOPMENT
OF PROCESS
SKILL
CURRICULUM
REFORM IN
SCHOOL SYSTEM
RELEVANCE
TO THE
INDIVIDUAL
AND THE
SOCIETY
COPING WITH
CHANGE
MASTER
LEARNING
MEETING THE NEEDS
OF THE
DISADVANTAGED
CURRICULUM
REFORM IN
TEACHER
EDUCATION
IMPROVING
TEACHER
COMPETENCIES

2. Teacher Competencies

A major function of science and mathematics education is to make the elementary and secondary curriculum answer the needs, problems and aspirations of the individual as he or she lives and participates in the community. This requires that the teacher acquires competencies that will enable him to plan and arrange for learning experiences that have practical applications to the learner's daily life, both immediately and in the future. In this regard, teacher education programmes should ensure the development of competencies in the prospective teacher which call for the ability to:

- apply scientific and mathematical knowledge and skills to the dynamic real-life problems of the learner;
- facilitate learning that is relevant to the learner's own background and entry characteristics, by simplifying the teaching of science and mathematics, while at the same time moving on from this point to the wider considerations of the community and the world at large;
- nurture motivation for learner performance on a continuing basis; and
- make societal/macro concerns relevant and meaningful to individual learners.

To achieve the above general competencies, the teacher has to develop personal and professional competencies such as the ability to:

- clarify his personal beliefs about teaching and learning and set these against those on which the curricular reforms have been based;
- be sufficiently flexible and confident in their own basic teaching abilities to try out new approaches to science teaching and recognize new content;
- to use the support of his colleagues and, in return, be himself supportive;
- be persistent in the face of difficulties and have problem-solving skills to find workable solutions;
- use a wide range of communication modes in his interactions with learners;
- internalize a humane and conservationist values system to guide, regulate, and temper his actions;
- select content useful to the learner from his knowledge of the potential content to be taught;
- judge the time necessary for the learner to achieve depth of understanding and consolidation of skill and attitude development;
- locate and fully use all indigenous resource: not only those immediately available and obvious but also those that require identifying, preparing, collecting, constructing and negotiating availability; and

- identify, begin from, and build on the strategies, interests, beliefs and explanations the learner brings to the classroom.

3. Strategies for Teacher Training

An evaluation of the curricular offerings in science education is needed to make the curriculum always relevant to the needs and problems of the individual and society. This task will need a number of strategies like the following:

- Identify in the curriculum the scientific and mathematical concepts/topics/issues that have relevance to the individual and to the country.
- Interview people of various ages and occupational interests about the most common problems/issues, related to science, that have to be resolved.
- Prepare a list of the common concerns that are included in the existing curriculum such as:
  - utilization of resources,
  - environmental conservation,
  - drug education,
  - nutrition education,
  - responsible parenthood,
  - indigenous medicine,
  - energy resources development,
  - electronics and communication technology.
- Identify sub-concepts and related ideas for each key concept to enable the teacher to break down the 'big lessons' into 'small lessons' thereby facilitating the process of organizing and simplifying each lesson.
- Integrate common concerns in the existing science and mathematics curriculum in graded difficulty both in the elementary and secondary school levels.
- Identify useful traditional practices relevant to personal life and environmental conservation and perpetuate them in the schools.
- Provide interesting motor activities to help the learner understand concepts/process/issues.

4. Illustrative Example

The gross learning task:

Deciding on what traditional practices are appropriate for personal health and environmental conservation.

The task description:

- Assign students to identify/observe traditional practices.
  Note: The teacher sets the assignment a day or two before the actual lesson
- Interview senior citizens in the community to collect more data
  Note: The teacher suggests that students interview not only their own parents and grandparents but also others who can serve as resource persons
- Brainstorm with other students to refine ideas
  Note: The teacher divides the class into groups and makes the groups exchange/share their findings with others before a report is prepared.
- Set up criteria for categorizing traditional practices
  Note: The teacher and students set up criteria for categorizing practices and deciding which ones are desirable.
- Categorize into traditional practices for personal health and traditional practices for environmental conservation, etc.
  Note: The teacher asks the students to list the practices according to the categories decided upon.
- Evaluate the practices to decide which ones are desirable.
  Note: The teacher motivates the students to analyze which practices are desirable.
- List the desirable traditional practices for personal health and traditional practices for environmental conservation, etc.
  Note: The teacher asks the students to prepare the list of desirable practices according to the categories agreed upon.
- Cite actual situations where traditional practices may be employed/applied. Note: The teacher allows the class to share/exchange ideas and experiences citing actual instances where practices may be applied.
- Adopt and practice, e.g.:
  - exercises for the eyes
  - using stairs instead of elevators
  - walking to school instead of riding
  - talking in low tunes (to lesson noise pollution)

- avoiding loud playing of stereos (also to lesson noise pollution)
- preparing compost
- using compost in place of or to complement artificial fertilizer

- Note: The teacher and other class members observe each other class members observe each other to see if they apply the practice when appropriate. Projects like setting up a compost pit and a plant plot to show effect of use of compost will be required.

- Evaluate the impact of practices
  Note: The teacher asks the class to report on the positive and negative effects of the practices.

- Follow up periodically for continuation of practice.
  Note: Students who show positive impact of the practice will be given recognition either by the teacher as the school itself. The community can be encouraged to continue practices with positive impacts as shown by student projects.

The activities given in this illustrative example is expected to be used by teacher educator, with the prospective classroom teacher, before the teacher himself uses them with his pupils.

B. Mastery Learning: Reinforcement of Learning

1. Mega-Trend

In an ideal situation "mastery learning" should mean that each student secures 100 per cent attainment for any learning outcome specified in the curriculum. Attainment of this level, however, may not be possible right now in the developing countries in the Asia and Pacific region. Hence as a transitional measure only, a teacher may set for his group of students a somewhat lower target e.g., a minimum of 75 per cent attainment in the specified learning outcome, by at least 75 per cent of the learners.

2. Teacher Competencies

The major competencies for attaining mastery learning are:

- facilitate initial learning, reinforcement of learning and the application of learning;
- provide for minimization of learning difficulties;
- provide for additional learning facilities

3. Strategies for Teacher Training

To develop the above three competencies, six different strategies are described below:

(a) *Integration of content with methodology*

Facilitation of initial learning, reinforcement and application becomes possible only when the teacher is very clear about the content of the curriculum. Therefore both pre- and in-service teacher training programme should include a reasonable component of content suitably integrated with methodology.

(b) *Moving towards learner-centred approaches*

Learning is facilitated by the active participation of the learner. Hence teacher training programmes should emphasize methodologies aimed at ways and means of increasing active involvement of the learners in different types of activities.

(c) *Observation of model lessons*

Trainee teachers benefit by observing lessons conducted by "good" teachers. Therefore facilities in actual classroom situations or on TV be provided to the teachers to observe such lessons including those conducted by the teacher educators. Observation should be followed by group discussions among teacher trainees and between them and the teacher educators.

(d) *Games and playway methods*

To help teachers in creating a positive attitude towards learning, the teacher should design games or other informal methods such as role-play for effective transition of the curriculum. These types of exercises will help the learner in retaining the concept for a longer period, which is basic to mastery learning.

(e) Criterion-referenced testing

To identify and minimize learning difficulties the teacher should be well-versed in the techniques of developing criterion-referenced tests. By identifying specific difficulties discussions in small groups or preferably individual tutoring should be adopted.

(f) *In and out of school activities*

To provide additional learning facilities utilization of 'free periods' for remedial teaching and individual assignment be done in and out of school timings.

4. Illustrative Exemplars for Reinforcement of Learning

The concepts selected are addition, subtraction, multiplication and division for the target group of learners age 10-11 years B. The teacher will write down on the blackboard the following two sets of numbers.

Set I

	Rows				
	4	8	12	16	20
Columns	24	28	32	36	40
	44	48	52	56	60
	64	68	72	76	80
	84	88	92	96	100

Set II

	Rows				
	3	6	9	12	15
Columns	18	21	24	27	30
	33	36	39	42	45
	48	51	54	57	60
	63	66	69	72	75

Through discussions and questioning the teacher will bring out the following features about Set I:

- All numbers are multiples of 4
- All two successive numbers in a row have a difference of 4
- Every two consecutive numbers in a column have a difference of 20

The teacher will now invite the students to perform the following operations and seek answers to the questions listed below:

1) Add last number of the first row to any number in any row.

   Do you find the total appearing in the numbers already listed in Set I. (The total always corresponds to the number placed immediately below the second number).

2) How many times is the above pattern repeated in the set?

   (Pattern is repeated 20 times in 5 columns x 4 rows = 20)

3) Work out the difference between two diagonally placed consecutive numbers:

   (a) Can a pattern be identified in the result?

   (b) Starting from upper row and going down from left to right and vice-versa, how many times is the pattern repeated?
   (Pattern is repeated 16 times each way).

4) Add the first and the fifth numbers in the first row and calculate the meaning:

   (a) Does the mean appear in the numbers already listed in the set?

   (b) Is it in the first row and third column?

   (c) Is the pattern repeated for all rows?

5) Add second number and fourth number of the first row and calculate the mean.

   (a) Does the mean tally with the mean obtained under question 4(b) and (c)?

6) Is the exercise given in questions 4 and 5 true for all columns as well?

7) Add any two consecutive numbers placed from left to right or right to left in the same row.

   (a) What is the inference?

8) Repeat all the exercises given for Set I for Set II as well.

9) Construct two such similar sets. Which of the following do you notice?

   (a) Do all sets starting with even numbers contain all even numbers?

   (b) Do all sets starting with odd numbers have odd and even numbers repeated alternatively?

10) *Simulating exercise* Arrange 25 children in rows and columns with any particular such set of numbers displayed on their chests and backs. Repeat the exercises given above.

C. Science Education for All

1. Mega-trend

This includes curriculum reforms pertaining to science (including mathematics) education, which seek to accommodate the fact that learners are heterogeneous rather than homogeneous with regard to their interests and entry competencies. If this becomes imperative that science and mathematics education should cater for the needs of every learner, viewed as an individual, regardless of the learners' gender, socio-economic background, ethnic group and his or her geographical location (e.g. those disadvantaged by their geographical isolation).

2. Teacher Competencies

Teacher competencies required to effectively implement this curriculum reform are intertwined with competencies within the other nine mega-trends. The

teacher thus should be able to integrate the various competencies into appropriate complexes to suit varying class-room situations.

Specifically teacher competencies required to contribute to the realization of the goals of science education for all comprise the ability to:

- accommodate diversity in learners;
- enhance achievement and so
  - evaluate achievement against agreed norms
  - evaluate achievement against agreed norms
  - interpret the norms set for achievement and the results of evaluations undertaken
  - sustain/motivate learners to maximize achievement levels
  - convert intended learning outcomes regarding the curricula into relevant applications
  - nurture life long learning skills
  - be sensitive and cope with the current trends/developments in science and mathematics.

In addition to the above competencies and in relation to providing science education for all, teachers should have the ability to develop learning environments/situations that will help all students develop such "appropriate" attitudes and values. This competency is considered important since it helps to facilitate and motivate learning of science amongst students. Children coming from some backgrounds, significantly those from disadvantaged groups, tend to consider science and mathematics as difficult subjects to learn. Science and mathematics teachers in this region should be sensitized to this learner attitude. Learning these two subjects should not be allowed to continue to be a painful experience for learners. The teacher should learn to arrange appropriate learning situations and environments that will create the right atmosphere to develop positive attitudes and values amongst students and make the learning of these two subject a real pleasure.

3. Strategies for Teacher Training

The following be considered as being critical to the development of the previously mentioned competencies in teachers.

The curricular inputs into the training of a teacher should emphasize more practicum experiences in the programme. The strategy is to bring about a better understanding aspects of educational psychology and pedagogy and grasp the theory in practice. This is reinforced through macro/micro teaching practice and during the practicum programme.

All aspects of the teacher education curriculum should emphasize an integrated approach to teaching. Skills of integration within science and mathematics and across the subjects should be imported.

The aspects of pastoral care should cater the entire Teacher Education Programme. This experience will inculcate a culture of pastoral care and guidance amongst teacher trainees which would be extended by them to their pupils in school.

Teaching and learning strategies in Teacher Education Colleges should take the form of multi-directional communication. This would serve to demonstrate to the trainee how he could become a facilitator of learning rather than a lectures. As such the role of the teacher educator as a facilitator in the pre-interaction, interaction and post interaction sessions are emphasized. In employing the facilitation techniques other strategies such as discovery learning, brainstorming, group methods, role playing demonstration, simulation, discussion and group work should also be utilized and this in turn would contribute to enhancing the trainees' skills in the strategies mentioned.

The development of multigrade teaching techniques should be fully provided for in the training programmes both in pre-service and in-service teacher education.

Science teachers need to constantly update their knowledge and skills in order to orient their teaching to the latest trends in science and technology. Resource Centres of Teachers' Colleges should be upgraded to provide the facilities to meet the above needs.

Teacher education programme should provide the opportunity and encourages trainees in the utilization of available local materials and resources to authenticate the teaching-learning process. This will develop in trainees the ability to utilize the available local materials and resources to facilitate learning even to the groups that are disadvantaged in terms of location and learning facilities. Thus in teacher education, teaching and learning strategies should reinforce the practice of resource-based teaching-learning as well as student-centred teaching-learning strategies.

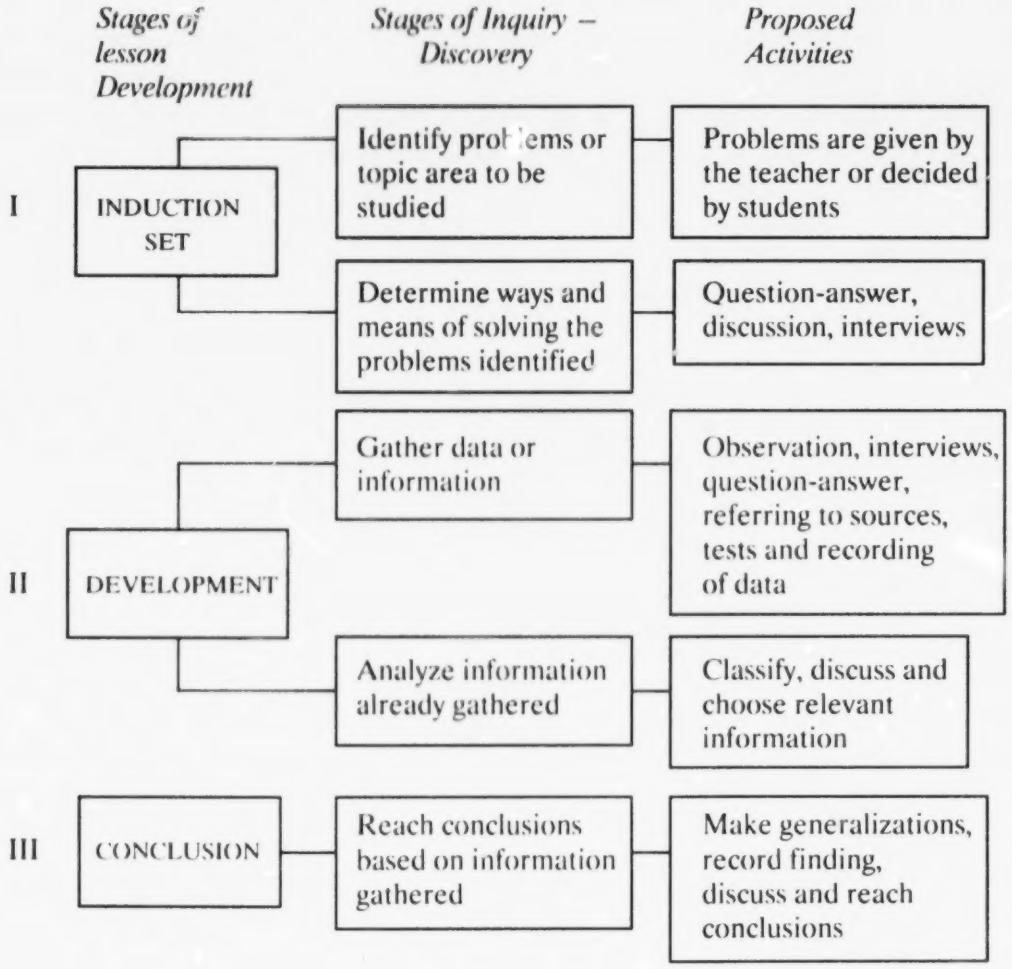
4. Illustrative Learner-Centred Teaching-Learning Strategy via Inquiry-Discovery Method

i) Trainees are required to take the role of 'planners' in their learning activities.

ii) Teacher educator takes the role of facilitator and as a guide to the students.

iii) The diagram shows the relation between stages of inquiry-discovery processes and the stages of the lesson as well as activities to be done at each stage.

Stages of Inquiry - Discovery Learning


Stages of lesson Development
Stages of Inquiry – Discovery
Proposed Activities
I
INDUCTION SET
Identify problems or topic area to be studied
Problems are given by the teacher or decided by students
Determine ways and means of solving the problems identified
Question-answer, discussion, interviews
II
DEVELOPMENT
Gather data or information
Observation, interviews, question-answer, referring to sources, tests and recording of data
Analyze information already gathered
Classify, discuss and choose relevant information
III
CONCLUSION
Reach conclusions based on information gathered
Make generalizations, record finding, discuss and reach conclusions

D. Development of Process Skills : Experienced Based

1. Mega-Trend

The course objectives of the Science curricula in most countries emphasize the development of process skills in the learners. Yet the content specifications of these curricula include large numbers of topics, with long lists of concepts, to be covered within the limited time allocation for learning science. The inclusion of excessive content in the curriculum may be resulting from the popular view that school education is the ideal agency for increasing the knowledge of the country's citizenry. However, it is questionable whether the rapid and extensive coverage of the content provides for meaningful learning and adequate understanding of concepts. Of the many concepts included in the Science curricula some may, indeed, be beyond the level of cognitive development of the learners for whom the concepts are intended. Even with respect to those concepts that are within their reach, the learners may not get the opportunity of acquiring them meaningfully. This is largely due to the rush for covering more and more content in the available time. The learners, then, are compelled to memorize information in place of meaningful learning. This type of education can provide only a weak foundation for further school learning in Science as well as for undertaking learning as a life-long process. The foundation needs to be strengthened with transferable learning skills, or process skills, needed for collecting and processing information and for using inquiry procedures for solving problems.

When children come to school they already possess some learning skills. At school these skills need to be refined, made habitual, extended or replaced. And to find the time for this the content load in the present curricula may need to be reduced by applying more stringent criteria for sampling content.

The process skills expected to be developed through school education include mental, social and manipulative skills. Science, by its very nature, provides a powerful medium for developing these skills and, in addition, science is among the few school subjects that can accommodate the development of transferable manipulative skills. To achieve this the teacher would have to use a variety of teaching strategies which provide for optimum learner involvement in the learning-teaching process. This, in turn, demands the development of certain special skills through teacher education.

2. Teacher Competencies

a) Understand what is meant by process skills in science education, including the ability to :

- identify the various process skills such as observing, measuring, classifying, formulating hypothesis, controlling variables, interpretating, making inferences, questioning, communicating, etc.

b) Understand why various process skills are important to be developed in science education, including the ability to :

- present science as both a process and a body of knowledge.

c) Design activities involving various process skills, including the ability to:

- identify the science concepts/principles in the curriculum offerings where the valuing process skills could be developed in the learning-teaching activities.
- identify the relationship among the science concepts/principles.
- prepare good worksheets.

d) Plan activities using the environment as a learning resource, including the ability to :

- identify and select learning resources available in the environment to study essential science concepts/principles.
- Design and make simple teaching aids using locally available low cost and no-cost materials.

e) Arrange and conduct practical sessions efficiently, including the ability to :

- create an atmosphere conducive to learning.
- manage the classroom (in its widest sense).
- encourage an active or positive student-teacher and student-student interaction.
- ensure student involvement in the learning-teaching process.

f) Use appropriate techniques in assessing students' achievement in acquiring various process skills, including the ability to :

- assess students' learning outcomes and use the results as feedback for improving teaching-learning process.
- help students who have difficulties in learning science.

g) appreciate the limitation of the application of the processes of science, including the ability to :

- illustrate the tentative nature of scientific knowledge.
- recognize situations that are susceptible to scientific investigation as against those which are not.

3. *Strategies for Teacher Training*

For both pre-service and in-service programme of teacher education, more involvement of trainees in learning-teaching process and practicum experiences are considered to be the important parts.

The following are suggestion for developing the process skills during the training programme.

a) Discussion sessions to develop a clear conception about what is meant by process skills and why these skills are important in science education.

b) Demonstration lessons by the trainers relating to different process skills in science education.

c) Each trainee selects a lesson and identifies various concepts and process skills involved in the lesson which can be developed in the target group of learners.

d) Trainees prepare their own lesson plan on that lesson considering the relationships among concepts/principles.

e) Trainees practise teaching using their lesson plan in a simulated/real class.

f) Discussion sessions on the performance of the trainees in teaching practice.

g) If necessary, trainee repeats the teaching session with modifications based on the conclusions of the discussion.

4. *Illustrative examples*

a. Example # 1

The purpose of this session is to stimulate and help trainees to understand:

1) Why worksheets are used?

2) How a good worksheet, involving various process skills, may be prepared.

It is important that trainees appreciate the quality of a good worksheet. They should also be familiar with its usefulness especially in the context of practical exercises. They need to be competent in preparing effective worksheets, using short sentences and simple language.

Without any introduction, let trainees to work through two worksheets, (one good and one bad) given to them. The apparatus required for these worksheets should have been made ready beforehand. When they have worked through the two given sheets , ask the trainees to comment on the effectiveness and usefulness of each worksheet.

Afterwards let trainees discuss the two worksheets they have used. They should compare and criticize them, choose the easier one to use. Finally, they summarize the different points about writing a good worksheet.

Preparing Worksheet

Divide the trainees into groups of three each. Ask each group to prepare one worksheet, requiring 30 minutes work from the pupil, on a simple experiment, for which equipment is already available.

Testing Worksheets

1) The trainees should remain in the same groups of three as in the previous session. Name four groups A - J, and arrange them in pairs as follows :

A with B	E with F	I with J
C with D	G with H	

Each pair of groups now tests each other's worksheet. Thus group A will test worksheet written by group B, while at the same time group B will test group A's worksheet, and so on. So group A actually sets up and performs the experiments written by group B, following instructions exactly and identifies the process skills intended to be developed. They also have to write down the answers to the questions asked in the worksheet. During this process group A makes notes about the *clarity* and *effectiveness* of group B's worksheet, the *adequacy* of the instructions, the *relevance* and the *quality* of the questions, etc.

Meanwhile and in the same way, group B tests group A's worksheet. Other groups work in the same way.

2) After the testing, the pairs of group discuss any problems they had in completing each others worksheets. They offer constructive suggestions for improving the worksheet they have tested.

The trainer should monitor these discussions very closely. Some of the worksheets may be poor in quality, and the trainees may find it difficult to suggest appropriate improvements. The trainer should be ready to offer suitable suggestions in such cases and use the features of a good worksheet as criteria.

3) Groups then rewrite their worksheets, incorporating the improvements that have been suggested.

Features of a good worksheet

Worksheets should contain :

1) the aims of activities.
2) a list of process skills to be developed.
3) a list of apparatus and materials required.
4) essential instructions simply and clearly expressed, including diagrams if necessary.
5) any necessary safety precautions.
6) questions leading pupils to make relevant observations and deductions.
7) questions and problems to guide pupil's thinking as well as their experimental procedure.
8) open-ended questions involving further development of applications and ideas.
9) appropriate spaces for writing the answers and notes.

Points to note:

1) Too much writing should be avoided.
2) Worksheet should be appropriate to the needs and interests of a particular class.
3) Questions should be graded from simple to complex or from easy to difficult answers.
4) Ideas should be arrange in a logical sequence.

Producing better worksheets

1) All the trainees should have a discussion together. Let them list the features of a good worksheet, and make suggestions as to how to write a good worksheet. Summarize these points on the blackboard, and allow the trainees to note them.
2) The trainees now divide into the same groups as before and make further improvements to their worksheets, in the light of what they have learned from the discussions.

Advantages of worksheets

1) The pupils can keep it as a permanent record of their practical work.
2) The pupils do not waste valuable time copying instructions, and writing them up.
3) The pupils are guided towards making the appropriate observations.
4) The pupils can answer the written questions at their own speed.
5) Worksheets ease the trainers task of supervising the practical lessons.

b. Example # 2

The purpose of this session is to help trainees to identify and practice some process skills:

- planning
- observing
- questioning
- classifying
- communicating
- making inferences

Present video programmes/slides/filmstrips/pictures on the problems of resulting from cutting down trees in the forest. This is to be followed by a discussion, on forest conservation, for developing certain process skills.

Divide trainees into small groups of 6 to 7 and ask each group to design a plan for gathering information regarding (a) why the forest areas are decreasing day by day and (b) how forests can be conversed. The tasks should involve :

- planning the tasks for gathering information,
- observations regarding utilization of forest product,
- interviewing local people,
- interviewing people working in the forest department,
- classification of information gathered through observation and interview,
- making inferences about conservation of the forest, and
- communication of the experiences to others.

Trainer should arrange a discussion session on the plans prepared by each group. Each group will present their plan of activities and other trainees will make comments and constructive suggestions. The trainer will help each group in improving their planning.

The questions to be put to the local people and persons working in the forest department should be developed by the trainees with the help of the trainer.

The questions may be of the following nature:

For local people

- What are the materials being used for heating purposes ?
- How do people obtain the above materials ?
- What kinds of materials are used for making furniture ?
- What kinds of materials are used for constructing houses?
- Where do these materials come from ?

For persons working in forest department

- Who is responsible for protecting the forest ?
- Why forest areas decrease day by day ?
- What kinds of plans are being made to increase forest area of the country?

After completing the task of observation and interviewing concerned people, a discussion is to be arranged within each group to be followed by a plenary session to discuss problems faced by the groups and share ideas and experiences.

Trainees will work in their group to classify the information they gathered from observation and interviews and make diagrams and draw some inferences.

Classification may be made as follows :

- Source of heating used by the majority of the people in the locality.
- Sources of heating used less commonly in the locality.
- Materials that are commonly used for making furniture.

On the basis of information gathered from observation, questioning and subsequent classification of the information, trainees will draw some inferences, such as :

- Most people in the locality use wood as the major sources of heating.
- Most furnitures used by local people is made of wood.

At this point the trainer needs to provide inputs to strengthen the knowledge base of the trainees, relating the issue.

Through these activities, the trainees can feel what process skills have been developed in them. So, at this point it is appropriate for the trainer to ask the trainees to identify process skills that will need to be developed in their pupils.

Chapter Five

MEGA-TREND IN CURRICULUM REFORMS IN SOCIAL SCIENCES AND LANGUAGES

After a thorough discussion of the working paper presented by the Technical Working Group, the Regional Study Group Meeting on Teacher Education split into two main working groups. Group A examined the mega-trends in curricular reforms in the natural sciences and mathematics, while Group B dealt with social sciences and languages.

Both groups used a common conceptual framework which is shown on page V-2.

This Chapter contains the outputs of Group B – Social Sciences and Languages.

A. Relevance of the Curriculum to the Individual and Society

1. The Mega-Trend

A closer analysis of the social studies curriculum in the primary and secondary schools will show that the curricular content calls for a unidisciplinary/interdisciplinary approach to instruction with the intent of presenting problems, issues and trends that are of local, national/regional and universal concerns. In fact, the foregoing is reflected in a number of social studies curriculum which follow, among others, the widening horizon, special curriculum concept-based and the cognitive-affective-manipulative based formats. By and large, the lessons shown from the curriculum are presented in graduated difficulty and are tailored to the needs of the learners. And to make the teaching of social studies more functional, attempts have been made by social studies educators to include in the curriculum certain concepts/issues/trends that are relevant to the needs and problems of individuals in a given society.

2. Teacher Competencies

Making the social studies curriculum relevant to the needs, problems and aspirations of individuals in the country is the foremost task of social studies education. This task calls for a number of teacher competencies that will enable the teachers to present real-life case studies that have practical applications in one's daily life. In this connection, the competencies that have to be dealt with are the ability to:

- apply knowledge and skills to the real-life problems of learners;
- make societal/macro concerns relevant to individual learners.

3. Sub-Mega-Trend: Management of Resources

Different countries are endowed with natural resources for the use of mankind. However, observations and studies have shown that there are countries that have more resources than others. Some countries have two or more major resources while others hardly have any, hence, there is an unequal distribution of resources between different parts of the world. Needless to say, man needs resources in his everyday living. With the use of certain technologies there are countries that have exploited their major resources resulting in a serious disturbance in the ecological system which caused environmental imbalance in some parts of the world. Management of resources is an urgent need.

With the foregoing in mind, social studies curriculum writers through the years have managed to include the study of resources as a major concept in the social studies curriculum. The study of resources is presented in graduated difficulty, both at the primary and secondary school levels, with the end in view of showing the relevance of resources not only in the way of living of the people in their communities but also in communities near and far. The thrust, therefore, would be the identification of the various resources and the proper utilization, development and conservation of each one with the intent of making the needed resources of a country available to the greater number of its people for a longer period of time. Hence, the study of resources is relevant at all times to all students at all levels of the educational system.

4. Specific Competencies

An ability to:

1) identify the various natural resources that are found in the different countries of the world;
2) categorize the natural resources found in the different places in the world;
3) give the rationale behind the unequal distribution of resources;
4) compare and/or contrast how people in different parts of the world utilize their resources;
5) analyze how resources are put into optimal use by each country;
6) understand how people in different places manage their resources to meet the needs of their people;
7) interpret maps and charts that portray the study of the different resources;
8) prepare video and audio programmes to highlight the objectives that should be achieved in the teaching of the natural resources;

9) identify and visit places where resources are available or processed to enable children to learn through direct experiences;

10) present indigenous problems relevant to the management of resources in different forest communities;

11) identify the reforestation programmes that are on-going in the different communities; and

12) identify and visit places where information is available on natural resources of the area like museums on natural science, exhibitions, libraries where books and other relevant literature are available.

5. Strategies and Materials

1) Establish a resource centre where the natural resources from different places of the world could be displayed as well as maps, globes, charts and other pictorials showing different geographic settings.

2) Provide readings/handbooks/statistical reports that will help explain the unequal distribution of resources in the different parts of the world.

3) Utilize of audio and video programmes showing the management of resources.

4) Plan field trips to visit places where certain resources are available.

5) Establish linkages with institutions that work in the management of resources.

6) Plan a short-term seminar-workshop for pre-service and in-service teaching programmes to show the relevance of the study of resources:

- to the laws of one's country with reference to the protection of resources;
- to the way of life of the people;
- to internalize certain values that will help in the proper and wise use of resources.

6. Teaching Exemplar

A teaching exemplar for social studies using Don Tinkler's model in problem-solving.

Objectives

General

To develop an understanding of how countries manage forest resources in the different places in the world.

Specific

The students at the end of the lesson should be able to:

Cognitive

1) identify the forest resources that people use in different places of the world;

2) explain how people in certain places of the world utilize and conserve their forest resources;

3) encourage people to become aware of the laws governing the illegal use of forest resources;

4) give certain insights about the consequences of indiscriminate logging;

Affective

5) appreciate the works of agencies and institutions which make people aware of their duties and responsibilities with regard to the proper use of forest resources;

6) make the people committed to their duties and responsibilities in the wise and proper use of forest resources;

Psychomoter

7) construct projects portraying the forests and other forest products in a given community; and

8) prepare posters showing the consequences of illegal logging.

Content

Lesson:	Wise utilization and conservation of forest resources.
Organization:	Proper management of forest resources provide direction in the wise utilization and conservation of forest resources.
Readings:	Readings on forest and other forest products readings on management of resources.
Materials:	Maps, globe, charts, and other reports on forest resources.

7. *Teaching Strategy* (Don Tinkler's model of problem-solving)

Step I: Understanding the problem

1) Show some pictures and illustrations portraying forest communities.
2) Show a film showing the causes of massive deforestation.
3) Guide the students in raising both the major and the minor problems about deforestation and its consequences.
4) List down the content outline for the lesson. (The sources of information and other materials should be made available in the classroom.)

Step II: Information (data) gathering

1) Prepare a list of the extra information that shall be needed in the unfolding of the lesson.
2) Group the students into teams/groups in preparation for the gathering of information.
3) Inform the class that the information could be obtained by:
   a) reading books and other materials in the library about forests and forest resources.
   b) invite a resource person who knows the status of the forest resources in the country.
4) Identify the students who will carry out the task for the group, namely, the leader, rapporteur, members, and the like.
5) Inform the class about the number of hours/days that shall be spent during the research activities.

Step III: Clarifying issues

1) List on the blackboard the consequences of massive deforestation.
2) Discuss the effects of massive deforestation to the:
   a) individual.
   b) local community.
   c) country.
3) Ask the students to add more to the list of consequences of massive deforestation.

Step IV: Seeking solutions (What are the options?)

1) Brainstorm to seek solutions to the main and minor problems.
2) Make a list of alternative solutions to the problems like –

Examples: Total ban on logging
Selective cutting of forest trees

Step V: Choosing between options (The Best Choice)

1) Ask the students to state their option and the possible consequences of the choice.

2) List the possible gains in the option chosen.

3) List the possible losses that will likely result out of the option chosen.

Step Vi: Action recommended

1) After presenting one's stand on logging, guide the students in listing the suggestions/recommendations for the conservation and wise utilization of forest resources.

2) Name the students/school officials who can participate in projects that will help promote the conservation and wise utilization of forest resources.

3) Prepare a time-frame for the implementation of the projects.

4) Suggest the areas where similar projects can be launched.

5) Suggest ways and means on how people near and far could participate in projects on the proper conservation, development and utilization of forest resources.

B. The Development of Appropriate Values and Attitudes

1. The Mega-Trend

The inculcation of desirable values and attitudes in learners has now become an essential component in teaching-learning process. This has arisen because education or schooling views the learner as a total individual and the task of the school is to develop the individual. Such development is to produce the integrated individual, one who can seek the final aim of life or reach the goal. This individual is also responsible for his own well-being as well as contributing to the family, society and nation. The current fear of decline of discipline in schools and the moral standard in society have also prompted the emphasis on values education.

The measures that are being undertaken to develop values and attitudes in learners take many forms, including:

a) the introduction of school subjects such as moral education, religious education, ethics or civics education;

b) the introduction of the concept "values across the curriculum" - all subjects in the curriculum will undertake the task of integrating values at the appropriate places.

c) conscious efforts to strengthen the inculcation of values through extra-curricular (or co-curricular) activities and all other aspects of school life.

Every teacher and all members of staff in the school is equally responsible in this task of inculcating values. The concept "the teacher is the model of good behaviour and practices" is also being promoted.

2. Teacher Competencies

1) To be aware of the diversity of value-systems, the dynamics of social change, the stability of individual habits and social traditions and the need for openness in value-decision.

2) To provide learning environments/situations that will develop desirable values and attitudes in learners:

   - to identify/create learning environments/situations where the development of values and attitudes can take place;
   - to select, evaluate and utilize materials available for values education;
   - to develop appropriate materials for values education;
   - to make himself (i.e. the teacher) the model for the learner.

3) To use different methods to develop values and attitudes appropriate to the learning situations and the learners:

   - to foster in learners basic habits, skills, attitudes, norms, customary rules and practices of the society;
   - to inculcate basic concepts pertaining to life in society (e.g. co-operation, freedom, consensus) and basic concepts and principles in the study of values;
   - to help learners to clarify value concepts, ideas, problems and judgmental embedded in their relations to the self, society, environment and/or good;
   - to motivate learners to perform social and moral acts in accordance with customary norms or reflective rules;
   - to reinforce in learners positive attitudes and dedications to values confirmed with individual conscience or social ideals when confronted with temptations, barriers and oppressions;
   - to develop the ability of making choices, solving problems, and dealing with conflicts in real-life situations based on moral principles as well as social agreements;

- to encourage learners to participate actively in resolving problems and performing tasks in groups and social activities;
- to guide and counsel teachers on behavioural, attitudinal and judgmental problems towards a mature integrity of character in pursuit of the meaning of life;
- to motivate learners to pursue life-long learning for their well-rounded growth.

4) To evaluate the growth and maturation of attitudes and values in the learner:

- to understand the various modes of evaluation for the affective domain and to be aware of the limitations of existing modes;
- to understand the strengths and limitations of each mode of evaluation;
- to be able to construct evaluation materials using the different modes appropriate to the level of development of the learners;
- to conduct/administer the evaluation;
- to process, record and interpret evaluation;
- to provide feedback on learner's behaviour/performance to the learners themselves and to their parents (note: the positive aspects should be highlighted);
- to be able to take measures to improve learner's behaviour and his own (teacher's) performance.

3. Training Strategies

A number of strategies need to be used at both the pre-service and in-service programmes as well as on-the-job situations, such as the following:

1) Lecture-discussion-demonstration-practice:

- Lecture to be followed by discussions to enable the teacher to understand the basic ideas and principles pertaining to the dimension of life where values and attitudes are involved.
- Brainstorming sessions to discuss problems encountered in real-life situations, and to classify those problems into major categories.
- A brainstorming session to come out with (a) a list of major competencies a teacher need in dealing with problems in each category; (b) suggestions on ways to develop these competencies in the teacher; (c) a list of competencies in order of emphasis.

- Lecture to be followed by discussion on the types of situations where teaching and learning activities may take place, and distinct features of each type (e.g. classroom, co-curricular activities, and other school activities).
- Lecture, discussion, demonstration and practice of the various modes of teaching values and attitudes (e.g. instruction, use of audio-visual devices, group work, monitorial system, simulations, field-study), and their merits and limitations.
- Discussion and practice pertaining to the evaluation of development of values in pupils.

2) Practicum (for pre-service only):
   - trainees have the benefit of feedback regarding their performance, practices and behaviour inside and outside of the classroom from their supervisors and experienced teachers of the schools.
3) Extra-curricular activities or study group activities.
4) Formal or informal guidance and counselling (for personality development).
5) Publications, films, videos, correspondence and mass media.
6) A manual on the desirable teacher behaviour and practices (behaviour standards).
7) Trainers (lecturers) to be models of good behavior.
8) Monitorial system (pre-service only):
   - one trainer (lecturer) to be responsible for the good behaviour of certain trainees.
9) Visit schools to observe "good teachers" perform their duties.

4. Illustrative Example: Dealing with Conflicts in Values

1) Lecture on the nature of values or value-systems to help teachers understand how values are different from, and related to, facts; how values become values as such, (i.e. psychological and social, normative and genetic origins of values); and how values conflict with each other in concrete situations. Use examples such "Why should the weak be protected?", "How may filial piety conflict with telling the truth?", "Are you going to school today or staying at home because your mother is sick and badly needs your help?".
2) Discussion on models of teaching for dealing with value-conflict situations.

   An example of teaching model:

- identifying a value-conflict situation (e.g. between "filial piety" and "telling the truth" in a certain situation);
- clarifying the meanings of the value concepts involved in the situation (e.g. concepts of filial piety and honesty);
- suggesting alternatives for solution (encouraging students to suggest them);
- examining those alternatives one by one, considering the consequences of each when put into practice;
- making a choice among them (by means of agreement among the class member or using a certain criterion provided for the teaching situation);
- testing the solution in other imaginary or actual situations.

3) Brainstorming on the techniques of managing the classroom activities for value-conflict solution, e.g.

- ways of describing and specifying the situation for the learner's understanding;
- ways of encouraging the quiet students to present their own points of view and experiences;
- ways of stimulating students to imagine all the possible consequences following a certain act being taken.
- ways of managing discussions towards an organized form of conceptual system (grouping, ordering, relating, differentiating, etc.).

4) Discussion on the merits and limitations of the teaching models and techniques adopted for value-conflict situations.

Merits: e.g.

- learners will understand values in association with concrete situations.
- learners will understand a variety of meanings and implications of the value concepts.
- can develop habits of reflective thinking in learners.
- can develop a number of thinking abilities, such as logical, factual, dialectical and/or strategic.

Limitations: e.g.

- possible neglect of non-active students.
- possible occurrence of uncontrollable flow of discussions.
- possible difficulty in estimating time needed for the activity.

5) Discussion on the characteristics of value-conflict situation method in relation to other activities for developing values and attitudes, e.g.

- in relation to inculcating basic norms and attitudes.
- in relation to heteronomous or autonomous conceptions of value or morality.
- in relation to behavioural attitudinal cognitive dimensions of morality.

6) Discussion on the 'what' and the 'how' of evaluation concerning students' performance in value-conflict resolution.

The 'what': e.g.

- ability of developing imaginative, hypothetical situation and/or to contribute ideas.
- ability to provide logical or audiological justification for value assertions.
- attitudes to value-laden situations: co-operativeness, seriousness, sense of involvement, etc.
- habits of participating in discussions.
- habits of approaching value problems.

The 'how': e.g.

- observing behavioural tendencies.
- recording participation in activities.
- rating qualities of contribution.
- students' mutual evaluation.

C. Environmental Studies: Coping with Change

1. Mega-Trend

This mega-trend has a direct impact on the trend related to making the curriculum relevant to individual and society. The school curriculum is expected to reflect the idea that we are living in an era of rapid change – socio-economic, cultural

technological and aimed at providing knowledge, skills and values to help learners cope with and adapt to these changes.

2. Sub-trend: Environmental Education

This sub-trend is related to the teaching of 'Environment Studies' at the primary stage of school education. The content is derived both from the natural and social sciences as the age-level and cognitive-level of learner demands more emphasis on education in an integrated form rather an teaching of separate disciplines.

Scope of the Environmental Studies

- content related to natural, social, cultural aspects is integrated.
- changes occurring in the natural environment, and in the social environment due to economic development through advancements in science, technology and industrialization are reflected in the integrated content.

3. Competencies

The following competencies should be developed in the teachers:

General

- identify the Minimum Learning Outcomes (MLOs) expected to be attained by each learner.
- analyze, the content and prepare teaching plans for the semester academic year.
- plan strategies and teaching/learning processes.
- select, procure, improvise, and develop teaching/learning material available in the school/environment.
- plan, construct, and procure tools and techniques for evaluation.
- identify the areas of difficulty and plan remedial materials and processes.
- develop habits of continuous professional growth.
- undertake simple research for innovating teaching/learning materials and processes.

4. Specific

- plan specific strategies and activities to help learners:
  - acquire information about the immediate social and natural environment;
  - acquire knowledge and understanding of the human body, its growth and development, importance of cleanliness;

- understand the process of happenings/events taking place in the world around;
- develop norms and modes of behaviour consistent with values enshrined in the constitution;
- understand the cultural heritage and appreciate cultural similarities and differences, the contributions made by people of different regions, races and speaking different languages;
- develop understanding of the various social responsibilities and civic processes;
- develop an appreciation of the value of co-operative effort at the local, national and international levels for developmental activities;
- apply the knowledge, principles, processes, methods to solve academic and day to day life problems; improving the quality of life of individual and community;
- develop attitudes and values such as objectivity, precision, goal directedness, etc.;
- develop critical thinking and appreciation of historical happenings in *the country* and *the world*;
- develop interest in and appreciation of contribution made by science and technology in improving life.

5. *Teaching-Learning Strategies in Teacher Education*

Pre-service

- Individual/group assignment
- Lecture-cum-discussion methods
- Seminars
- Library study
- Excursions/field visits
- Model lessons by teacher educators
- Teaching practice in simulated/real classroom situations.

In-service

- Seminars/discussions
- Model lessons
- Visits to model schools

- Mass media modes
- Correspondence lessons.

School-based programmes (self-learning)

- Teachers/principal clubs
- Staff meetings
- Meetings of the subject teachers of cluster of schools
- Meetings with subject supervisors, and parents
- Mass media
- Peer supervision research in classroom problems
- Model lessons
- Library study.

Distance education

Correspondence lessons

Contact programmes

Use of mass media

6. Illustrative Example

Teacher training strategy: Developing a lesson plan and delivery model lesson.

Topic: Air pollution — causes and prevention

a) Identifying the Minimum Learning Outcomes (MLOs), the learner will:

- identify the kinds of pollution that occur;
- identify the various causes of air pollution;
- list the precautions to be taken to prevent air pollution;
- practice the habits and behaviour that help prevention of air pollution.

b) Selecting and organizing the content:

- types of pollution (air, water, noise);
- the need to keep air free of pollution (bad effect of polluted air on the health of people);
- causes of air pollution (emission of industrial smoke, gases and defective move of transport; improper sanitation; deforestation [burning]);

- ways to prevent or reduce pollution (establishment of industrial emitting harmful gases away from residential areas, proper checking up maintenance of means of transport; keeping the environment clean; planting more trees).

c) Selecting/developing teaching/learning materials (environment, textbooks, mass media, charts and pictures, video films, if possible, and library books).

d) Planning strategies and activities:

- identification of specific factors and sources of air pollution in the immediate environment (questioning and note taking; visiting establishment causing air pollution, library study).
- listing the effects of air pollution on the health of human beings.
- identifying the ways to prevent air pollution, minimize the effects of air pollution.
- practicing the precautionary ways in life in school/outside school (cleanliness of surroundings, plantation of trees, physical exercises, etc.).
- preparing slogans and messages.
- organizing cleanliness campaigns in the local community with the help of school children.

e) Evaluating the attainment of Minimum Learning Outcomes by each learner:

- identifying the technique of evaluation (oral questions, written questions (objective type and short answer type), and observation).
- identifying the technique of observation (short-term and long-term) such as checklists, rating scale.
- scoring and recording of the evaluation data.
- using the data for diagnosing the strengths and weakness and planning enrichment and remedial teaching.

D. Languages in the Context of Education for All

1. Rationale

- In the implementation of universalization in education, language is of vital importance for communication purposes within all communities at the national and international levels.

- As language is the medium of instruction in every subject area, every subject teacher should provide good models of language learning skills. This in itself is an innovation that should be adopted.
- Language teachers should be equipped with teaching language techniques and skills in
  - the mother tongue
  - the second language
  - the foreign language.
- There appears to be a shift from literature-based curriculum to areas where language should be functional, communicative and an effective tool for further learning.
- A general innovation common amongst the countries in the Asia and Pacific region is the stress on the use of vernacular as medium of instruction from early to middle primary schooling.

To allow for these innovations to succeed the following competencies in teacher education should be developed:

2. *Teacher Competencies*

1) A thorough mastery of the language of the learners manifested by teachers serving as good models in listening, speaking, reading, and writing.

   Under these four skills teachers should be equipped with appropriate competencies in the different areas:

   Listening

   - Ability to listen attentively to pupil responses and reinforce them accordingly.

   Speaking

   - Ability to speak correctly, distinctly and audibly and using language appropriate to the learners' level.

   Reading – oral reading

   - Ability to read distinctly, correctly audibly and expressively focusing on the learner.

   Silent reading

   - Ability to read with concentration so that they are able to comprehend, analyze and interpret materials.

Writing

- Ability to write legibly in a standard style.
- To write correctly making sure there are neither spelling errors nor punctuation errors.

2) Ability to understand the language ability of the learners.

To achieve this goal teachers should be equipped with these competencies as listed below:

Listening

- Ability to be conversant with learners' dialect or language.
- Acquire a thorough knowledge of sentence patterns in the medium of instruction.
- Be conversant with language of different social backgrounds.
- Be able to converse with learners at learners' level.

Reading – oral reading

- Ability to acquire standard speed of reading using correct intonation, pronunciation and expression.
- Understand analyze, evaluate and interpret, discuss the story, and guide children's responses.

Writing

- Ability to understand the writing of pupils so that they can correct children's
- style of writing
- punctuation/grammar/sentence patterns.

3. Strategies

To achieve the above-mentioned competencies the following strategies should be adopted in pre-service and in-service teacher training programmes. Pre-service and in-service course should develop the four skills of language learning.

Learning skills

The following are strategies used to train the teachers to teach listening skills to pupils:

- Aural comprehension
- Note taking in lectures, with regard to
  - Analyzing
  - Condensing
  - Evaluating
  - Reproduction.
- Standard pronunciation
  - Sounds
  - Stress
  - Intonation.

Speaking skills

The following are strategies used to train teachers to teach speaking skills to pupils:

- Interviews
- Introductions
- Conversations/dialogue
- Discussions
- Debates
- Speeches
- Dramatization/role playing
- Story telling
- Recitations poems/rhymes
- Summarizing
- questioning/answering
- Interpretations.

Reading skills

Oral reading – The following strategies are devised to train teachers to teach reading to pupils:

- dramatization
- essay/story reading

- poetry/verse reading
- recorded reading
- reports
- reading summaries.

Silent reading skills should be provided through reading notices, information, instructions, signs, advertisements, newspapers, magazines, stories, etc.

Writing. The following strategies are designed to train teachers to teach pupils writing reports, summaries, essays, letters, plays, dialogues, poetry, advertisement, telegrams, form filling comics, cinema strips, puzzles, games, etc.

4. Methods and Materials

Ability to adopt relevant methodology related to language learning with particular reference to silent reading as an example.

Teacher competencies

An ability to:

- arrange classrooms and organize pupils in ways that are conducive to silent reading.
- provide and select suitable reading material for grade/level and for children's *reading age*.
- have a thorough understanding of the reading materials.
- observe children and to conduct discussions and to be quite skillful at the different questioning techniques.
- devise follow-up activities e.g. written activities or group activities.

Introduction

In a silent reading lesson teachers are expected to have the ability to:

- observe pupils closely to see whether they are reading silently or not.
- observe whether pupils are concentrating in ways that lead to comprehension.

Although the focus of this activity is on silent reading, in any language lesson other skills of language learning are integrated into the lesson. To optimize learning, speaking, listening and writing skills need to be assessed.

Objectives

Teacher/pupil must have the ability to:

- read silently with concentration so that comprehension would be achieved.

- listen attentively to discussion and to the questions asked by the teacher.
- speak distinctly and correctly with intonation and correct pronunciation.
- write legibly with correct spelling, punctuation, sentence patterns and structures in different applications and styles.

Activities

A language lesson should be based on activities which make use of resources that are easily accessible in the environment.

All language lessons should develop the four skills to maximize learning.

Activity 1

Silent reading

1) The teacher provides a story which pupils read silently and with concentration to attain cognitive skills, e.g.:

   - understand meaning of words from contextual clues.
   - understand sentences.
   - differentiate between facts and opinions.
   - sum up the story.

2) Discussion of story involving speaking and listening skills.

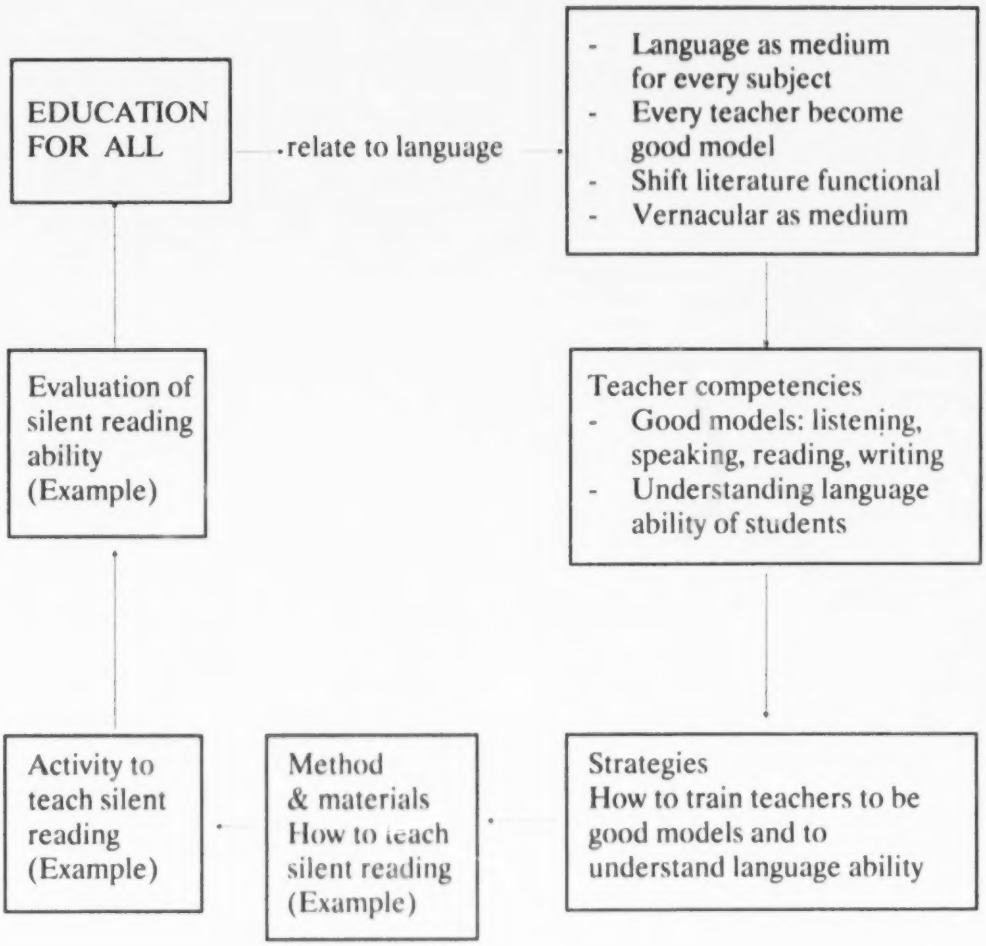
   - Teacher asks questions based on the story using several question types and techniques to guide children to full comprehension of story.
   - Pupils should be able to describe or retell the story.
   - Pupils should be able to make comparisons and analyze the story.

3) Teacher should provide a written activity which may be answered individually or in groups. The activity may be questions based on story and word study activity based on new vocabulary, e.g.

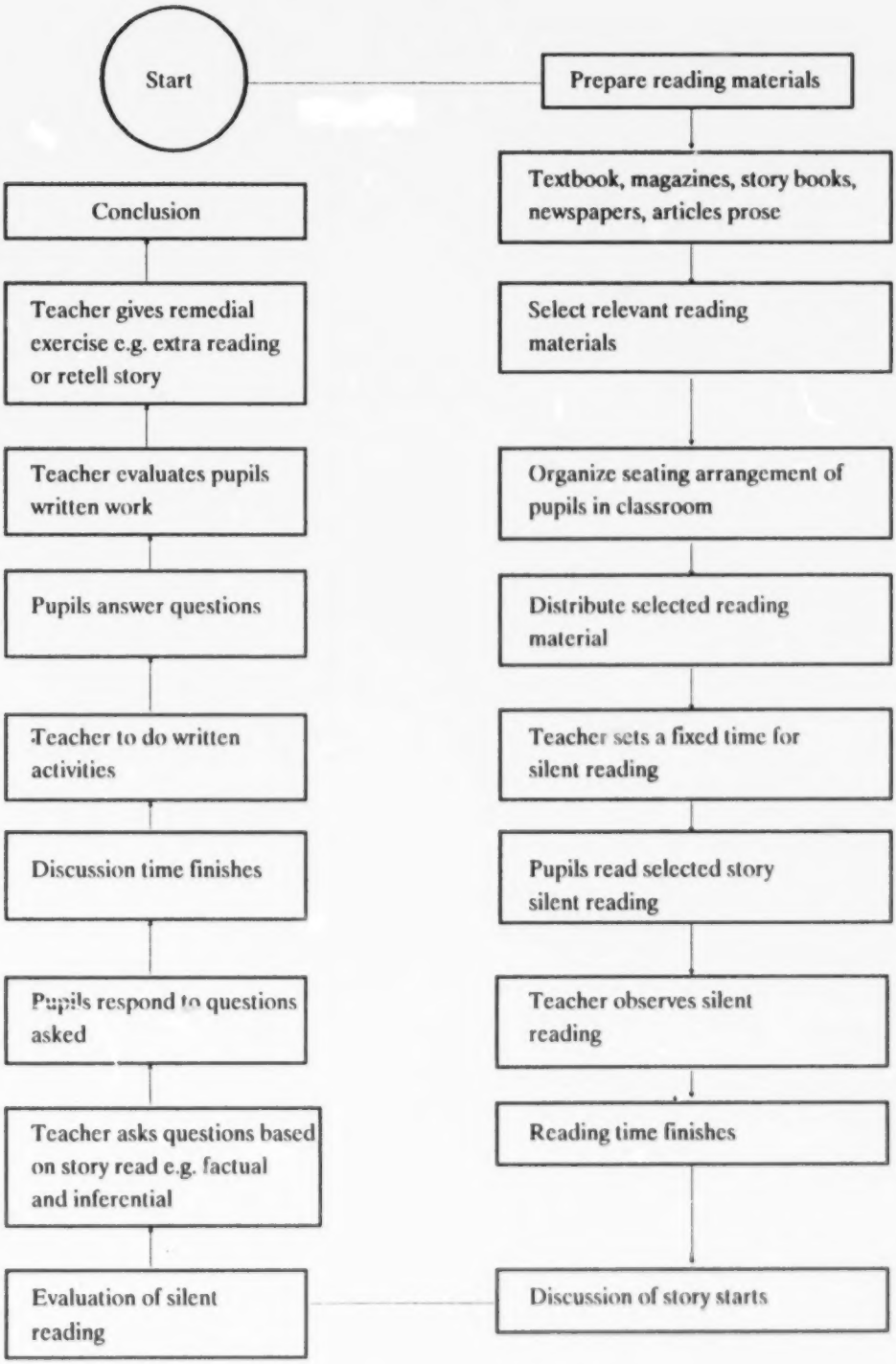
   - Word meaning
   - Matching
   - Filling spaces
   - Antonyms/synonyms
   - Rhyming/Homonyms
   - Word families/word building
   - Crossword puzzles, etc.

   - Pupils may also write a summary of the story or create a story of their own.

Conceptual Framework for Language Teacher to Meet The Mega-Trend : Education for All


EDUCATION FOR ALL
relate to language
- Language as medium for every subject
- Every teacher become good model
- Shift literature functional
- Vernacular as medium
Evaluation of silent reading ability (Example)
Teacher competencies
- Good models: listening, speaking, reading, writing
- Understanding language ability of students
Activity to teach silent reading (Example)
Method & materials How to teach silent reading (Example)
Strategies How to train teachers to be good models and to understand language ability

Procedures for Teaching Silent Reading


Start
Prepare reading materials
Textbook, magazines, story books, newspapers, articles prose
Select relevant reading materials
Organize seating arrangement of pupils in classroom
Distribute selected reading material
Teacher sets a fixed time for silent reading
Pupils read selected story silent reading
Teacher observes silent reading
Reading time finishes
Discussion of story starts
Evaluation of silent reading
Teacher asks questions based on story read e.g. factual and inferential
Pupils respond to questions asked
Discussion time finishes
Pupils answer questions
Teacher to do written activities
Teacher gives remedial exercise e.g. extra reading or retell story
Teacher evaluates pupils written work
Conclusion

Chapter Six

TEACHER EDUCATION REACHING OUT TO EDUCATIONALLY DISADVANTAGED GROUPS

1. Introduction

Groups of population with restricted of opportunities to develop economically, socially, culturally and educationally have been defined as being disadvantaged groups in most of the countries in Asia and Pacific region. However there are intra- and inter-country variation in the degree of the disadvantage(s) of one or more than one types.

All countries have designed educational systems which aim at providing minimum Education for All their citizen. But due to various factors some groups of population remain deprived partially or fully of educational opportunities. And these groups are categorized as educationally disadvantaged groups.

Some of factors that contribute to making a group of population 'Disadvantaged' are :

a. Low socio-economic condition due to low income, social customs and taboos.

b. Isolated and scattered population in a certain geographical areas, such as hilly areas, forest areas, remote areas and atolls.

c. Ethnic characteristics of minority groups, such as linguistic, religious and racial, etc.

d. Social factors, such as status of women in society.

e. Nomadic life/shifting from one place to another due to occupational requirements.

f. Poor facilities in rural areas and urban slums.

g. Destructions caused due to natural and man-made calamities.

h. Lack or absence of educational facilities.

i. Irrelevancy of curriculum to the needs of the various population groups.

2. Categories of Disadvantaged

Although what constitutes being a member of a disadvantaged group varies from country to country, the following are the categories of disadvantaged found in the Asia-Pacific region.

Females/Girls

In many countries girls have lesser opportunities of schooling and have also higher drop-out rates as compared to that of boys. There are many reasons for this lower participation of females in schooling. The low rate of enrolment among girls is by and large due to socio-cultural reasons, especially when there is an absence of female teachers. It is also felt that the girls role is confined to jobs within the four walls of the home as a daughter, a wife and as mother, and no formal education is required for performing these roles.

Low Income Groups

There are groups of people in every country in the region who are poverty stricken. Many of these parents cannot afford to send their children to school, or else they do not value highly what the school system has to offer their children. Instead the children often join the labour force at an early age in order to supplement the family income and so help the family to survive economically. This category comprises population in urban slums, and underdeveloped rural areas; landless labours; and unskilled unemployed, etc.

Rural Population

In several countries there is a sharp distinction in the educational participation rates of the rural population and of that in urban areas. One factor contributing to the lower rates of enrolment and retention is the disparity in the quality of educational facilities and the quality of teachers in these areas. Some other factors affecting the spread of education in rural areas are illiteracy of the adults, and irrelevance of the curriculum to the needs of the community.

Population in remote/isolated areas

In all countries there are groups of population who live in isolated areas and have no easy access to school or to non-formal education centres. This situation often manifests itself in lower than normal school participation rates of the populations of these areas.

Nomads and other shifting population groups

In some countries there are tribes and other groups of people who shift from one place to another, due to their occupational requirements, over-utilization of the

land for agriculture, etc. Due to the mobile nature of these population groups, regular education of children is affected.

Ethnic/minority groups

Children from ethnic/minority groups sometimes do not have equal opportunities of education in terms of relevance of curriculum to culture, values, attitudes of these population group. Other factors that contribute to their educational disadvantages are their linguistic, racial and religious characteristics. However, all minority groups are not educationally disadvantaged.

Refugees

In some countries the children of refugees are also educationally disadvantaged.

Orphans

The main factors responsible for creating this category of disadvantaged group of children are natural or man-made calamities.

Although the educationally disadvantaged populations that exist in countries in Asia and Pacific region have been categorized as above, they are not necessarily discreet and separate categories, for there is often an overlapping and clustering of these characteristics, for instance in the case of girls, the group comprises girls from ethnic/minority groups, from rural areas and from low-income families. And also, each of these categories of educationally disadvantaged groups do not necessarily exist in all countries in the region.

3. Implication of these Disadvantages to the Educational Programmes

The achievement of the target of education for all children has been accepted at the international level as the major goal of educational programmes in all developing countries. Hence, there is a need to make special efforts to provide comparable education to the disadvantaged population in terms of access and quality of schooling.

In this effort to provide education to these groups three areas warrant consideration: (i) the qualitative aspects pertaining to the school facilities and teachers; (ii) the qualitative aspects pertaining to the learning process and the environment and materials related to it; and (iii) motivation of the learners and the community with regard to schooling.

4. Present Status

In majority of the countries in Asia and Pacific region some programmes have already been planned/initiated to tackle the problems related to the education of the disadvantaged groups.

All countries in Asia and the Pacific subscribe to the principle that a child's access to, and participation in, schooling, and the standard of education received, should not depend upon whether the child is enrolled in a government or non-government school, their sex, ethnicity, race, religion, socio-economic status, regional location or the financial capacity of the child's family to support his or her schooling. They also support the widely accepted view that it is the right of every child, within practicable limits, to be prepared through schooling for full participation in society, both for his/her own and for society's benefit.

At regional level also concern with reducing educational disadvantage within member countries in Asia and the Pacific region has been implicit in all the programmes mounted by UNESCO's Asia and the Pacific Programme of Educational Innovation for Development (APEID). It is in fact the linchpin of APEID's activities, and contributes to a much needed systematic approach to human resource development in the region. Whether documenting the changing status and roles of teachers in the Asia-Pacific region, probing the nature of quality, efficiency and reforms in teacher education, or pursuing fourth cycle (1987-1991) activities such as the universalization of primary education, the education of girls and education for the world of work, APEID's emphasis is always upon innovations, developments and reforms which will help ensure that schooling systems are responsive to the needs of their populations, and provide them with better opportunities for full access to and participation in education, so that all individuals (regardless of their gender, socio-economic and cultural characteristics) have an opportunity to develop their talents to the full.

The Asia and Pacific Programme of Educational Innovation for Development is currently undertaking a comprehensive survey of educationally disadvantaged population groups in its 28 member countries to develop a reliable and up-to-date knowledge base regarding the extent and types of educational disadvantage in the region, and the goals and strategies that have or are being developed to tackle educational disadvantage. It will therefore seek to provide a reliable, research-based bench mark data against which the success of future reforms, developments and innovations in education can be measured with regard to their impact on reducing educational disadvantage.

5. Suggestions

The following suggestions emerged from the discussion on issues related to the education of the disadvantaged group of society :

a. More concerted efforts should be made to provide equal opportunities to these groups in terms of access to education and provision of essential facilities (physical as well as materials).

b. Motivation programmes should be planned for education both adults and children of these groups. These programmes may also include programmes related to health and nutrition and environmental education. Interventions of pre-school education may go a long way in motivating these children and adults.

c. Efforts should be made to link educational programmes with other developmental programmes aiming at integrated development of human resources.

d. Content related to social and cultural life of these groups may be integrated in the school curriculum. The curriculum should also include development of occupational skills related to the available resources and local needs.

e. At early stages, facilities for curriculum transaction in local language/dialect should be provided. The learning of standard regional/national language may be introduced gradually.

f. Alternative educational programmes should be planned for those children who are unable to join regular formal education schools or have to drop-out before completing a particular stage of education due to various factors.

g. Teacher training programmes should be restructured to accommodate the special educational needs of the disadvantaged groups.

6. Tasks Ahead

One of the major objectives of this meeting is to examine the responsiveness of teacher education to changes in the school curriculum in terms of developing the new competencies required of teachers, with particular reference to meeting the needs of disadvantaged population groups.

As is noted in the working document for this Meeting, this raises a number of important questions that warrant consideration, such as the following:

To what extent do these Mega-trends with regard to reforms in the school curriculum of member countries take account of, and accommodate, the particular needs of disadvantaged population groups, such as girls and women, low income groups, ethnic and racial minority groups and those living in isolated areas?

What are the specific examples of the ways in which these population groups in member countries are being accommodated at the primary and secondary school levels, and in particular subject areas in the natural sciences and the social sciences?

What are the implications of such changes in the school curriculum for teachers competencies in terms of the knowledge and skills they will require to adequately undertake their additional responsibilities, with particular reference to the needs of disadvantaged population groups?

7. Emerging Issues and Concerns

In their discussion of the possible response of teacher education and school systems to coping with the special needs and problems of disadvantaged population groups in member countries, participants identified the following issues and concerns as warranting special consideration:

a. Many of the so-called disadvantaged population groups have a rich indigenous culture in terms of such matters as language, religion and the performing arts, and yet for them to be successful in the school system and broader society they need to be introduced to the characteristics of the dominant culture. This raises the issue as to whether we should attempt to promote a genuinely multi-cultural society through our school system, or whether we should encourage the adoption of a relatively homogeneous national culture and identity.

b. The matter of language needs to be very carefully handled. It may be seen as desirable that the indigenous languages of minority groups be used as the language of instruction in order to facilitate learning. However, if this is at the expense of them becoming proficient in the national language, or foreign languages such as English, then this may result in them becoming third class citizens in their own country.

c. Is it necessary to train those who are going to work with disadvantaged population groups in separate institutions, or should they be trained in the same institutions as those who are being prepared to work in the mainstream school system? There are both advantages and disadvantages of having a separate teacher education programme for those who are going to work with disadvantaged population groups, and these have to be carefully weighed by those involved with policy making in this area. For example, if those from disadvantaged population groups, such as hill-tribe communities, are educated in teacher training institutions in city areas, they may be reluctant to return to their isolated communities upon completion of their training.

d. The content of teacher education courses provided to train teachers to work with disadvantaged groups needs to be carefully considered. For example, perhaps they should be taught anthropology and sociology of the groups with whom they will be working with as part of their training in order that they can better understand them.

e. There are a variety of problems associated with the notion of 'positive discrimination in favour of the disadvantaged', and so with regard to policy making in education this is not a straight forward matter. For example, the middle class who pay larger taxes than the poor will object very strongly if they feel that their children are not being treated fairly. In addition the differentials between the well-to-do and poorer members

of the population are difficult to cancel out in the short-term through the operation of the school system. To illustrate this point it could be said that while the poor child is trying to climb up a rope ladder to achieve his or her goal of success, the learner from the more affluent family is traveling on an escalator upon which he is also walking.

f. If schooling is to be attractive to disadvantaged population groups the curriculum must be framed so as to ensure that the knowledge and skills taught are regarded as relevant by the communities involved. Only then will there be motivation for them to send their children to schools.

Chapter Seven

TEACHER EDUCATION VIA DISTANCE EDUCATION

Teacher education through distance education emerged inter alia to meet the need for trained teachers in many countries of Asia and the Pacific. In many countries unqualified teachers are being hired because of the non-availability of trained teachers to serve the need of the disadvantaged groups. There is an urgent need to upgrade the qualifications of such teachers. This has invariably been difficult for two main reasons: first, many primary schools are too far away from teacher education institutions, and many of the untrained teachers cannot afford to travel and stay in the teacher education institutions even when schools are not in session; secondly, during school days, they cannot leave their classes, without sacrificing the welfare of students and important concerns of their own families. Through distance education it is now possible for the untrained teachers to undertake courses to upgrade themselves, wherever they are.

In many countries there are enough trained teachers. However, some studies have shown that five years after graduation from teacher institutions teachers' effectiveness tends to gradually decline unless systematic in-service education programmes are provided for them after a stipulated period of time. Again, it has not been easy for teachers in remote areas to avail themselves of opportunities for professional growth. However, with the advent of distance education, a golden opportunity has dawned on teachers in service to continuously upgrade their knowledge throughout their professional career.

In the country papers presented at the Regional Study Group Meeting on Teacher Education, it was reported that three categories of teachers make up the potential target groups of teacher education through distance education in Asia and the Pacific, namely, (a) untrained and underqualified teachers, (b) trained or semi-trained teachers, and (c) those who received formal teaching qualifications long ago but who never found an opportunity to upgrade and refresh their knowledge since their initial training and induction in the profession. Distance education programmes are, therefore, predominantly geared towards meeting these broad categories of needs through credit programmes aimed at providing teaching qualifications, and through non-credit, continuing education programmes designed to periodically upgrade and update the quality of teaching of qualified and trained teachers.

The situation in the countries represented in the Meeting is summarized below and in the page which follows:

Country	Institutions/ Mechanisms	Programmes	
		Degree Diploma & Certificate courses	Ad Hoc Programmes
Bangladesh	Bangladesh Institute of Distance Education	B.Ed.	
China	1. China TV Normal College 2. China Educational Television 3. Centre Radio and TV University	Teacher Education degree T. Ed. degree T.Ed.degree	In-service courses on: 1. Normal school & junior normal college levels 2. Demonstration lessons by master teachers 3. Lectures for primary & middle school principals & educational administrators
India	Indira Gandhi Open University	Diploma B.Ed.	
	NCERT Summer-cum-corres		in-service programme
Indonesia	1. Universitas Terbuka (open university)	B. Ed. Diploma programme	
	2. Centre for Communication		in-service programme
Iran	1. Bureau & in-service training 2. Peyame-Noor University (Distance Education)	Post-secondary diploma Integrated Bachelor Degree (e.g. Science & B.A., B.S.,B.Ed.	Certificate
	3. Islamic Open University	B.A., B.S.,B.Ed. M.A., M.S.,M.Ed. Integrated Bachelors Degree	Subject programmes

Country	Institutions/ Mechanisms	Programmes	
		Degree Diploma & Certificate courses	Ad Hoc Programmes
Lao PDR	Television Programme		In-service programmes on methods of teaching different subjects like mathematics & physics
Malaysia	1. Science University of Malaysia	B.Sci., B.A.	In-service academic programmes through print and non-print materials, radio and T.V.
	2. Education Media Service Educational Technology Division		
Maldives	Non-formal Education Unit, Distance English Course		In-service Education, English Course via educational and radio programmes, print and non-print materials
Myanmar	Correspondence Education System	Teacher Certificate two-year course	
	Summer courses		In-service programme
Nepal	Training Programme through Radio 1957 (RETT)	Certificate	In-service training programme for teachers
Pakistan	Allama Iqbal Open University	PTC, CT, B.Ed. M.Ed., ATTC,	Other in-service programmes
Papua New Guinea	College of Distance Education Correspondence course	B.A. & B.Ed.	In-service programmes

Country	Institutions/ Mechanisms	Programmes	
		Degree Diploma & Certificate courses	Ad Hoc Programmes
Philippines	ETV Programme		In-service programmes through demonstration lessons by master teachers
Republic of Korea	Korea Air and Correspondence College	B.A.	
Samoa	USP, Radio Programme	Certificate, diploma and degree	
Sri Lanka	Distance Training Institute of NIE	For non-graduate teachers	
	Institute of Teacher Education of NIE	Post graduate Diploma in Education	
Thailand	Department of Teacher Education, In-service Teacher Training Division Ramkamhaeng & Sukhothai Thamathirat Open Universities	Certificate in Education B.Ed. M.Ed.	In-service training programmes
Viet Nam	Radio-TV and Correspondence		In-service education tion programmes for foreign languages & other subjects

Distance education is an important innovation that enables training programmes to be offered to untrained or partially trained teachers unable to be released by their schools or education departments for full-time study. It is a particularly appropriate form of educational provision in developing countries where people recognize the need for education, training and the updating of skills but are constrained by the need to continue in full time employment and the lack of adequate potential sponsors. Although many of the courses are aimed at teachers who want to upgrade their qualifications, courses are also offered for those in various other areas of employment such as science, business management, law and humanities who want to extend their formal education. Both degree, diploma and certificate courses are offered.

One of the important aspects of the provision of distance education which has a substantial impact on the quality of the provision is the writing and production of appropriate learning/training packages. The suitability and quality of these materials are crucial to the success of any distance education programme, and so a number of national and regional workshops have been conducted to assist member countries in developing suitable approaches to the production of such materials.

Distance education provides many benefits that are not shared by more conventional instructional delivery systems. In addition to being able to reach people who are outside the constituency of conventional delivery systems, the cost per student is generally considerably lower than that in the formal system. In addition the whole chain of operations in distance education are methodical and in accordance with a systems approach to learning. From an assessment of the need for a particular course to the launching of such a course there are a number of pre-conceived steps which are regulated according to the systems approach. Distance education also makes use of the new educational technologies in areas such as video, television, radio and computer assisted learning.

It is not easy to upgrade the qualifications of thousands of untrained teachers in remote areas. However, with the emergence of distance education what used to be seemingly impossible can now be achieved. The upgrading of untrained teachers and in-service education for trained teachers, especially those in remote areas, are crucial steps towards the improvement of education in general, and particularly in helping the disadvantaged groups to effectively participate in development efforts as well as to have quality of life. For teachers and others living in remote areas who are unable to benefit from conventional means of education distance education becomes a necessity.

Conclusion

To reach the greater number of trained and untrained teachers particularly in the remote areas of many countries in the Asia and Pacific Region, many countries have established distance education programmes. There are others, however, which have instituted non-formal in-service education programme through correspondence, as well as radio and television programmes. Of the 18 countries in the Asia-Pacific Region represented at the UNESCO/APEID Regional Study Group Meeting on Teacher Education held at Chiang Rai, Thailand, from 25 June to 6 July 1990, thirteen countries so far have launched their formal distance education programme for teacher education while the other five countries have adopted the non-formal distance education programme scheme, that is, they merely offer non-degree courses to teachers.

While it is true that distance education may not be as effective in ensuring and improving the quality and competencies of teachers in comparison with the training in the formal educational institutions (Although there are some who would disagree with this viewpoint), it is generally believed that distance education is a viable alternative scheme that will help provide easy access to teacher education. Likewise, it is rendering good service to upgrade the competencies of both trained and untrained teachers in communities near and far.

Chapter Eight

PROPOSED RESTRUCTURING OF TEACHER EDUCATION

The scientific and technological changes, and the socio-economic and political demands currently taking place in the countries of Asia and the Pacific, require that these countries undertake a restructuring of teacher education. There are, however, variations from country to country in the manner in which the restructuring processes are conceived and carried out. The direction of efforts is dependent on the particular needs and priorities which these countries have identified. In some countries, the existing institutionalized system of teacher education has not met the increasing demand for qualified teachers. Distance education was, therefore, set up to meet such needs. Other countries have moved quickly in expanding teacher education institutions throughout the nation to provide professional training of teachers. While there are differences between countries with regard to the restructuring of teacher education, one common goal is shared: that is, to respond to educational needs at the primary and secondary levels, in terms of the number of teachers required and the need to equip teachers to implement the curricular programmes.

Responsible Agencies

Agencies responsible for the restructuring of teacher education are of two main systems: institutionalized or non-institutionalized. Institutions such as the teacher training schools, teacher colleges and faculties of education of the universities and institutes of teacher education, fall into the first category while radio programmes, education through the use of television, correspondence courses and other forms of distance education belong to the second, non-institutionalized approach.

1. Pre-service teacher education

In the countries of Asia and the Pacific teacher education institutions are typically structured to provide pre-service training for teacher. The educational programmes provided lead to the award of either a certificate, diploma or degree. Almost all programmes require class attendance or high degree of teacher-student contact.

2. In-service teacher education

Although the institutionalized system like teacher colleges and the university faculties of education are primarily responsible for the pre-service education of

teachers, many of them also organize in-service training programmes to enable the continuous upgrading of teachers' knowledge, competencies and proficiencies throughout their professional career. In some countries where an institutionalized system is inaccessible, and where unqualified teachers are being employed because of the non-availability of trained teachers to serve the needs of the disadvantaged groups, various forms of distance education have been introduced.

Alternative structures such as staff development units, extension centres, school clusters, or systems of master teacher have been set up to upgrade the current teachers with the new competencies required.

Administrative Level

Administrative structure of teacher education in Asia and the Pacific exist at different levels, notably: national, provincial, district and at the level of the individual school. The national university of education, the education faculties in universities, the bureau of in-service training and staff development units are the central bodies at the *national level*; while teachers colleges, teacher training centres and extension centres occur at the *provincial level*.

It should be noted that the concept of school-based teacher education is also prevalent in many countries of the region. This approach has gained popularity because conventional training programmes at the national and provincial levels do not always fully meet the needs of individual schools. Very often the training courses merely duplicate what teachers have learned during their college days. It is also difficult for teachers to leave their schools to attend professional development courses without disrupting the learning programmes organized for their students. With the school-based concept, schools can take the initiative in identifying their training needs and bring in the requested expertise to the schools. It has been found to be an effective alternative to traditional approaches to the developments of teacher education programmes.

Process Model for Restructuring Teacher Education

Many countries realize that the teacher education programmes developed are largely irrelevant and ineffective because the programme development and implementation processes are not always systematic and logical. The process model below is a suggested conceptual framework for a logical and systematic teacher education programme at the primary, secondary and tertiary levels. It is proposed for use by both institution-alized or non-institutionalized approaches to teacher education and at all administrative levels whether they be national, provincial or at school level. It is hoped that this process model will help make teacher education relevant, effective and efficient in order that it will ultimately benefit both primary and secondary school children, and both the advantaged and disadvantaged population group attending schools.

(1) Competencies required	(2) Course Syllabus	(3) Material Development/ Dissemination	(4) Training/ Education

(5) Research/Evaluation

The key variable in this model may be elaborated upon as follows:

1. Identification of the teacher training needs (or the required competencies) is a crucial stage that will help develop a teacher education programme that is relevant to the actual educational needs of children at the primary and secondary levels, including educationally disadvantaged groups. Research or evaluation methodologies, properly applied, could help in the identification of the real needs or new competencies required. These most probably covering both the theoretical foundations of teacher education and the practical aspects of the programmes .

2. The second step of the process is the development of the course syllabus. This should be responsive to the identified needs or required competencies so that teacher education will (in turn) be relevant to education at the first and the second levels of schooling. The course content, modes of delivery, strategies for training, and evaluation of the students achievement all need to be designed at this stage.

3. Material development should also be undertaken if the success of the teacher education programme is to be ensured. However, very often training programmes are initiated without sufficient backup of the necessary materials. It is, therefore, imperative to have systematic planning of material development and dissemination.

4. The training or educational programme referred to in the model related to the actual operation of the programme. This is most likely to function smoothly when the procedures adopted are adequately and systematically planned. Besides teachers, principals, supervisors, teacher educators and those in leadership positions in the ministry at all levels need to undergo professional development.

5. Research and evaluation should be integrated into every stage of the programme. Its purpose being to help ensure the efficiency and effectiveness of the programme. As a result of research or evaluation, decisions can be made on the basis of solid and reliable information as to whether the programme should be continued, modified or terminated.

It is anticipated that by using the process model proposed above, that teacher education programmes will be more efficient, which is a necessity at the current time in the member countries of UNESCO due to the resource available. Teacher education will also be able to respond much more directly to the real needs (since the first requirement of the programme is to identify the training needs or teacher competencies) be *more effective* (since the process is logical and systematic), and will be more *reliable and vigorous* since it is supported by research or evaluation-based information.

Restructuring Teacher Education for Qualitative Improvement

The quality of the teacher education provided is of major concern to all countries in Asia and the Pacific. Although efforts have been made to acquire a high standard, success at achieving this varies between member countries in the region. Some recent initiatives in some countries to achieve this aim are worthy of consideration:

1. Lengthening teacher education programme. To cope with rapid change and the advancement of the world community, many countries have lengthened the period of compulsory (or basic) education from 6 year to 9 years, and in some countries from 9 years to 12 years so that their citizens are better able to compete with other countries in the region. As a consequence, teacher education programmes have also been lengthened. In so doing, teachers are expected to have adequate knowledge, skills and attitudes to meet the demands of the expanded compulsory education.

2. Emphasis on in-service programmes. Very often the importance of in-service teacher education is not fully appreciated since it is assumed by many that once teachers graduate from a pre-service programme, that their training will adequately equip them to teach over the full length of their teaching career. Consequently, many countries largely allocate resources to pre-service programmes and pay little attention to the provision of an adequate in-service programme. If education is for individual and national development, in-service programme for teachers need to be given more attention.

3. School-based teacher education. Teacher education programmes, particularly in-service training, are mainly designed by central bodies at the national and provincial levels. In some countries it has been found that when schools are given the opportunity to take initiatives in in-service training of their teachers, that the training programmes are more responsive to the real needs of the local communities. Teachers of the schools are also more enthusiastic about their professional improvement which certainly have lasting impact on the education of children. As an extension of the school-based concept, programmes can also be organized at a school cluster level.

Chapter Nine

RECOMMENDATIONS

National Follow-up Activities

During the Meeting new ideas and experiences have been exchanged and various issues and problems discussed. It is recommended that each member country examine these recommendations and then take action suitable to its own needs to make their systems of teacher education more responsive to curricular changes at the school level with particular reference to the needs of educationally disadvantaged population groups.

Regional Follow-up Activities

At the regional level it is recommended that APEID take action to:

- further facilitate the exchange of ideas and experiences at a regular interval (say, every 2 to 3 years) on the issues and problems regarding teacher education discussed at this Meeting, with particular reference to materials development and meeting the needs of disadvantaged learners through improved teacher education;
- facilitate the exchange of experts between countries;
- facilitate the meeting of small groups to study, in-depth, some of the main issues raised at this Meeting;
- to facilitate small groups from countries to visit other countries to study in-depth, and to gain first hand experience of, certain innovative projects in teacher education;
- encourage the sharing of research experience between member countries, and the conducting of research in countries, into relevant areas examined during this Meeting;
- when the report of the APEID study of educationally disadvantaged population groups is completed, to produce a publication for dissemination to member countries which examines in a specific way the implications for teacher education in terms of content, materials and teacher competencies.

Development of Networks and a Clearing House

APEID to take the initiative to develop a regional network and a clearing house to facilitate the exchange of teacher education content and materials relevant to developing teacher competencies to implement curricular reforms at the school level with particular reference to the needs of educationally disadvantaged population groups.

Need for Research and Evaluation

Research and evaluation (for basic information gathering, and of an applied nature) should be part and parcel of every aspect of the teacher education process to enable decisions to be made that are based on sound and reliable information, and to enable the content and processes of teacher education to be continually improved.

Co-ordination between Teacher Educators and Curriculum Developers

Teacher education is one of the main ways in which curriculum changes at the school level are actually translated into action, and yet there is often a time lag between the development of new curriculum and the responsiveness of teacher education in terms of developing the necessary new teacher competencies. It is therefore recommended that a 'Consultative Committee' be established in countries consisting of curriculum developers, teacher educators and relevant others so that a continuous dialogue at regular intervals can occur between them which encourages greater co-ordination of relevant activities.

Catering for the Educationally Disadvantaged

The educationally disadvantaged groups face many problems with regard to their schooling one of which is a lack of competent and dedicated teachers who also understand their way of life and needs, and this contributes to their low levels of achievement. Thus it is recommended that a Study Group meet to work out in some detail what is, and can be, done to help rectify this situation. Countries could also consider incorporating into their teacher education policies specific measures with regard to recruiting, deploying and providing incentives that help insure that those who are trained to work with disadvantaged populations actually remain in the schools where such learners are located.

Career Long Development of Teachers

In a world of rapid change there is a need to accept that teachers and administrators require professional development over the full length of their teaching career; and that this does not just apply to classroom teachers but other educational personnel in leadership positions at the school level such as principals of schools as well as those at all levels in the Departments of the Ministry of Education.

Alternative Structures for In-service Education

Various strategies for in-service education need to be explored appropriate to the different categories of teachers types of competencies to be developed, in particular distance learning (and its many variations) should be continued.

Professionalization of Teachers and Accountability of Teacher Education

It is recommended that greater efforts be made to professionalize teachers as an occupational group. Such professionalization would require the following elements:

1. Teachers to undertake applied and action research to improve their performance;
2. The adoption of a client-oriented approach were greater stress is placed on the importance of the learners in their charge, as clients to which they should be ultimately responsible.
3. A collective responsibility to their clients which should cross subject boundaries and any particular vested interest groups in the school.
4. A commitment to self evaluation and regulation within the occupational group.

ANNEXES

Annex 1

AGENDA

1) Inaugural session
2) Election of officers
3) Sharing of experiences: Presentation of country papers
4) Synthesis of main thrust of country papers including:
    i) New competencies required of teachers arising from curricular reforms.
    ii) An assessment of the extent to which reforms in teacher education include efforts to reach out to the most educationally disadvantaged population group.
    iii) Needs and requirements arising from reforms in teacher education.
    iv) Over all assessment of what has been done since 1987 in the training of educational personnel, including distance education;
5) Development of strategies and sample materials (i) to develop competencies required of teachers [cited in Agenda item 4(i)]; (ii) to cope with new needs and requirements [cited in Agenda item 4(iii)].
6) Discussion and finalization of the report of the Meeting

Annex 2

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UNESCO SECRETARIAT

1. *Mr. Hedayat Ahmed*
   Director, UNESCO Principal Regional Office
   for Asia and the Pacific (PROAP), Bangkok
2. *Dr. Leonardo de la Cruz*
   Head, Asian Centre of Educational Innovation
   for Development (ACEID)
   UNESCO PROAP, Bangkok

Annex 3

Address of Mr. Hedayat Ahmed Director, UNESCO PROAP to the Inaugural Programme

His Excellency, Mr. Sakul Sriprom, Deputy Minister of Education,

His Excellency, Mr. Banasit Salab-sang, Governor of Chiang Rai Province,

Mr. Suwan Chansom, Director-General,
Department of Teacher Education, Ministry of Education,

Distinguished Resource Persons, Participants,

Ladies and Gentlemen;

It is my great pleasure to convey to all of you greetings from Mr. Federico Mayor, Director-General of UNESCO, and to also extend to you my own personal welcome and best wishes.

This Regional Study Group Meeting on Teacher Education is being organized at a critical period: at a time when serious concerns are being raised by education authorities throughout Asia and the Pacific about the status of teachers and teacher educators, relative to other occupational groups, and about the extent to which the current systems of teacher education throughout the region are adequately preparing teachers to cope with their increasingly complex and important role within the classroom, school and broader community.

The enormous contribution that school teachers make to the advancement of society was well expressed by the great thinker, Henry Adams, when he said: "A teacher affects eternity.. (for).. he (or she) can never tell where his influence stops".

However, while many of us pay lip service to the view that teachers are important and indispensable to the advancement of mankind, in reality there is very little evidence in many countries to indicate that we actually mean what we say, and take this view seriously, when it comes to action.

This lack of social and economic commitment to teachers as an occupational group is reflected by such things as the fact that the salaries paid to teachers are generally much lower than are those paid to other professionals who require a similar

length of formal education and professional training; while the working conditions and social status of teachers appears to be in a state of continuing decline in many countries.

Yet, at the very same time that teachers' conditions of employment are being eroded, the responsibilities we give to our teachers are ever on the increase.

We at UNESCO believe, Ladies and Gentlemen, that there is an urgent need to do something to help reverse these damaging trends, for not only do they reflect poorly on the relative value placed on schooling in our communities but they also make it increasingly difficult to attract talented young people into the occupation. Yet this is at the very time when it is essential that we encourage people of high calibre, as reflected by both their intellectual capabilities and commitment to the betterment of mankind, to become teachers; for as it has so aptly been said, "no people can rise above the level of their teachers".

We have invited to this Regional Meeting on Teacher Education eminent teacher educators and curriculum developers from APEID Member States because we believe that each of you have a great deal to contribute to suggesting the much needed intervention strategies required to stimulate and sustain the professionalism of the teaching profession, and to help enhance the status of teachers.

In the last decade we have witnessed, in countries throughout the region, major efforts being made, and massive resources being devoted to, curricular reforms. And I salute those curriculum developers who have sought to develop curricular content and materials that seek to be effective instruments for promoting economic development, social change, and social cohesion.

Yet, in many countries, such noble goals have not been fully realized. In seeking an explanation for this unfortunate situation, could it be that the weak link in the chain have been the teachers in the schools who have not been an adequate vehicle for, and effective implementors of, such curricular reforms? In addition, have teacher educators fully studied the implications of the curricular reforms occurring in school systems for the new competencies, have these been adequately developed in teacher education institutions, through both the pre-service and in-service training of teachers?

In many countries there is an unfortunate and (I believe) unnecessary dichotomy between teacher education institutions and curriculum development centers, so that they do not really talk to each other, or plan effectively together to ensure that the intended, and much needed, curriculum reforms are actually effectively implemented at the school level.

This Regional Study Group Meeting on Teacher Education is a modest attempt, amongst other things, to pave the way for a revitalized and closer partnership between teacher education institutions and curriculum development centers.

As the title of the Meeting implies, we are, of course, particularly concerned with teacher education. As you are aware, whenever and wherever teachers' performance and effectiveness are open to question, teacher educators cannot escape experiencing some feelings of guilt, for our systems of teacher education are often blamed

for many of these inadequacies and shortfalls. It is said that one of the problems we face is that in many cases (to borrow the concept used by Professor Rodney A. Clifton of the University of Manitoba in Canada) teacher education tends to thrive more on the "encyclopedia of mythologies" than on an "encyclopedia of knowledge".

That is, teacher education is said to be based upon a model of enquiry and action that has as its foundation taken-for-granted and generally unquestioned "mythologies" rather than "rigorous and systematic enquiry".

This can be seen to be true in cases where teacher educators:

1) neither engage in relevant research nor publish scholarly work themselves;

2) stress an almost totally practical orientation in their courses: that is, when they attach almost total importance to practice teaching, and are often disparaging in their consideration of what may be called the more "scientific basis" of effective teaching and learning, in terms of the contribution of disciplines such as psychology, philosophy and sociology;

3) fall into the trap of ritualism, where, for example, they stress the writing of lesson plans at the expense of scholarly inquiry; and

4) where they build inter-departmental walls and barriers, so that there is little dialogue between various subject areas contributing to teacher education, and so no logical sequencing or integration of courses.

In addition, in some countries teacher education is quite isolated from the rest of the school system, such as curriculum development centers. And yet how can schools adequately prepare teachers to work in a developing and changing school system if such isolation is maintained?

If teacher education relies on the encyclopedia of mythology one wonders if the teaching profession can ever be truly confident in its pursuit of professionalism in order to be on a par with the other professions! My own view is that unless, and until, we truly professionalize teaching, we will never be able to obtain a fair deal (such as parity in salaries and social status) for the mass of teachers vis-a-vis other professional occupational groups. And that will not be good for the healthy operation of the education system, since without such an improvement in conditions of employment we shall never be able to attract bright and promising young women and men into the teaching profession.

Although I have been pointing to some of the problems currently facing teacher education and teacher educators, I should also point out that a great deal is also occurring in our countries at the current time that is highly positive and which will ultimately contribute to the betterment of school systems and to the welfare of children. This fact is clearly demonstrated in the recently published Unesco/APEID report *"Innovations and Initiatives in Teacher Education in Asia and the Pacific Region"*.

At this Meeting we hope to pave the way for closer collaboration and co-operation between curriculum and material developers, and teacher educators. It is also our hope that the Meeting will develop exemplar teaching and learning materials that are illustrative of, and will contribute to, the development of the new competencies required of effective teachers.

The task you are about to embark on entails not only hard work but also much creativity and innovativeness. Nicholas Murray put it well when he said: "people... can be placed into three classes: the few who make things happen; the many who watch things happen; and the overwhelming majority who have no idea what is happening". All of you are from APEID Member States, and in fact most of you are from Associated Centres, where you are important educational innovators. I therefore know that each and every one of you belong to the group who "make things happen"; and, as a result, you will have no difficulty in rising to the task in hand.

In addition, I feel sure the wholesome environment of beautiful Chiang Rai, and the extremely charming and friendly people of Thailand, will further inspire you to be creative and innovative.

In conclusion may I say that I trust that the seeds of innovation in teacher education, which you will create here at this Meeting, will prove to be an invaluable "cross-breed" type of teacher education seedling. When accorded tender loving care, at both the national and regional levels, like the plant seedling that flourishes with sunlight and water, so the innovations that you shall conceived of in this Meeting will, if given the right setting, the right nourishment, and the right climate, have the full potential to bloom.

I wish the Meeting every success.

Address by Mr. Sakul Sriprom
Deputy Minister of Education
Ministry of Education, Thailand

Mr. Director of UNESCO Regional Office,

The Honorable Governor of Chiang Rai,

The Deputy Director-General of the Department of Teacher Education,

Distinguished Resource Persons and Participants,

Ladies and Gentlemen;

I consider it a great honour and pleasure to be here with you this morning at the open ceremony of the Regional Study Group Meeting on Teacher Education. On behalf of the Ministry of Education and the Thailand National Commission for UNESCO, may I extend a cordial, warm welcome to you all to our country.

Ladies and Gentlemen, the Thai Government has for the past decade been placing emphasis on the improvement both in forms and essences on the teacher education of the country. Simultaneously, teacher education curriculum has continually been revised so as to produce new teachers and to train in-service teachers to cope with the change of the school curriculum both at the primary and secondary levels. In addition, the Government's policies at the present time are to focus on the extension of the compulsory education in the country from six to nine years. In this regard, the roles of teacher training institutions have become the most important element for the achievement of our policies. I can certainly assure you that the Thai Government will put all efforts in terms of the necessary budget and human resources and equipments to strengthen all teachers' colleges to become the local centres for the development of the grassroot education of our country.

I am therefore gratified to learn that this Regional Study Group Meeting is held to analyze the experiences of the participating countries in this particular aspect, to consider the varied innovations and initiative approaches and to seek alternative strategies for strengthening the existing and creating teacher education for the betterment of education at the grassroot level.

On behalf of the Ministry of Education, I am indebted to the Honorable Governor of Chiang Rai, Mr. Bunnasit Salub-sang and his staff, for their strong support to make this seminar possible at Chiang Rai. A special thank to UNESCO and APEID, in particular, for their continual support and assistance they have been giving to the promotion of education in this region.

As time is now most favourable, may I declare open the Regional Study Group Meeting on Teacher Education, and I wish you every success in your deliberations.

Thank you.

Annex 4

SCHOOLS AND DEVELOPMENT PROJECTS VISITED

On 29 June 1990, a study visit was arranged for the participants, resource persons and observers of the Regional Study Group Meeting on Teacher Education. Briefly described below are the schools and development projects visited.

Huayrai Samakkee School

Huayrai Samakkee School is a primary school in Maerai Sub-district, Maechan District, Chiang Rai. It is located in a wooden hill, along the way to Doitung which is a holy pagoda in Chiang Rai. There are two villages served by the school. The first is Ban Huay Namkhun village which has a population of 273. The people here are mostly Thai Yai or small groups of Thai. The second is Ban Huayrai village which stands at the middle of the hill. Many Chinese who migrated from China live in this village. They have their own culture. It has about 162 families.

There are many classes in Huayrai school from — kindergarten to prathom 6 (grade 6) with a total of 485 students. They are mostly hill tribes, such as Akha, Chinese, and small group of Thai (Thai Yai). They have their own language.

There are 18 teachers, one janitor in the school. There are three buildings.

The school motto is: "Good study, good sport, good disciplines and good moral".

Daily activities in Huayrai School

08.00 - 08.30 a.m.	- The student prepare to work in groups, such as: - cleaning the room, - cleaning school building, and - watering flowers.
08.40 a.m.	- The students assemble around the flag pole area. Attendance is checked, singing of the National song and hoisting the Thai flag.
	- They then exercise, after which they go to their classes.
09.00 a.m.	- They study until 12 o'clock.

12.00 a.m.	- Lunch
01.00 p.m.	- Resume study in the afternoon.
04.00 p.m.	- End of classes. - The students witness the lowering of the flag and then go back home.

Some important activities in this school

1. Co-operative shop,
2. Democracy activity,
3. Library, and
4. School – lunch programme.

Suksah Songkrah School

Background

The school is located at Maechan District Sub-division, Maechan District, Chiang Rai Province. It used to be a Border-Patrol Police School. In September 1958, the Ministry of Interior turned over the school to the Ministry of Education. The latter authorized the Division of Special Education Department of General Education to organize the school as the educational extension schools, boarding type, for the eight educational zone. At present there are two programmes of study:

- the primary education programme prescribed by the 1987 Primary Education Curriculum;
- the Lower Secondary Education Curriculum which stresses the practical aspect of vocational training especially the effective use of spare time in accord with the practical subjects learned. Classes range from grade one to grade nine.

Purposes

1. To extend educational opportunity to problem children facing difficulties to meet the Primary Education Act requirements e.g. the needy children, the hill-tribe children, children in troubled border areas.
2. To extend educational opportunities to the children facing difficulties to gain access to higher level of education in order to land in good jobs, to be good citizens, to be loyal to their nation, their king and to be faithful to their religious beliefs.
3. The Thai language project for the hill-tribe groups living on the border areas.

4. To create leadership qualities among youth from remote area, so that they become community development leaders in their own locality.

Student admission

The Department of General Education has assigned a quota to the organizations concerned in both Chiang Rai and Phayao Provinces.

At present there are 607 students enrolled in the school:

- Low-land Thai - 148 students (23.37%)
- Hill-tribe Thai - 459 students (76.63%).

Support

Her Royal Highness, Princess Thepratana Rajasuda offers 10 study grants annually.

Teaching staff and employees.

There are 34 teachers on the staff – 13 lady teachers and 21 male teachers, of which 27 are graduates from teacher training colleges and 7 are graduates from other teacher training institutions. There are 14 non-teaching employees, 5 women and 9 men.

Economic and social development projects for rural communities

1. Student vocational placement project to help finance students while studying in school, e.g. agricultural work, home economics, multi-skill occupational work and handicrafts.
2. Commercial lychee farming promotion project.
3. Cash crop farming project for the alumni as well as parents of the students.

Ban Maechan Primary School

The Ban Maechan Primary School located at the centre of the town caters to the educational needs of the Thai children in the area. It has 27 full-time teachers teaching grades 1 to 6. It has four buildings housing the classes for 585 pupils. It also provides housing to teachers.

At the time of the visit, a training workshop was in progress. The Ministry of Education in co-operation with the Chiang Rai Teacher's College set up a 7-day training workshops for 86 teachers from the different schools in the district.

The main objective was to develop the competencies of teachers not in the teaching of subject-matter but in developing the competencies of the teacher in teaching and using democratic processes. A Teacher's Manual was prepared by the

Teacher's College on how to teach using democratic process. The teachers studied and discussed the materials. They identify problems they anticipated they would meet and suggest possible alternative solutions for such problems. The participants of the workshop were also given the opportunity to become chairmen or secretaries of the smaller workshop groups.

This in-service programme for teachers is being organized by the Ministry of Education in co-operation with the 36 teacher training colleges in Thailand with the aim in view of providing at least one training programme within five years for every teacher. There are some 60,000 teachers who are to be retrained.

Doitung Development Project

The Deputy Governor of Chiang Rai who is also the Deputy Director of Doitung Development Project welcomed the participants of the Regional Study Group Meeting on Teacher Education at the Headquarters of the Project. The participants were briefed about the different components of the Project by the Deputy Director. His briefing was supplemented by a video film presentation about the Project.

Doitung is located in Maesai and Maechan Districts of Chiang Rai. It has a range of mountains where the forests have been destroyed to use the land for poppy plantation. The population consists of hill-tribes, which were widely scattered.

In order to put a check on destruction of the forests, and discourage growing poppy in 1988, the Project was launched at the instance of Her Royal Highness Princess Srinakarinthra. Twenty-three government developmental agencies are involved in this Project. The main objectives of the project are:

- to initiative and develop a 'model project' for systematic and integrated development which could be adopted in other underdeveloped areas;
- to help increase the income of people and also improve the quality of their life through the spread of education and health care programmes, setting up of small industry;
- to improve the agricultural production through introduction of a cultivation of suitable crops and opening up new avenues of marketing;
- to protect forests, encourage soil conservation and take precautions against ecological disturbances.

The Project has succeeded in achieving its objectives to a large extent.

Doitung Royal Palace

Doitung Royal Palace is situated on a hill at a height of 1010 metres above sea level. It is spread over an area of twenty acres. Its foundation stone was laid in December 1988 by the then Prime Minister of Thailand and was completed in one year. At present finishing touches are being done to the different parts.

The Royal Place belongs to Her Highness, the mother of the King of Thailand. The people of Thailand have contributed a lot in cash and kind for the construction of this palace as a sign of their love and appreciation of Her Royal Highness for the role she has played in the various development schemes of the country.

The palace consist of four wings connected to each other by corridors. One wing is for Her Highness, the second is where she meets visitors, third and fourth wings are for her daughter, the elder sister of the King of Thailand, and the latter's daughter, respectively.

The palace is made of teak wood and the architecture is of Swiss cabin style.

The Asia and Pacific Programme of Educational Innovation for Development (APEID) has as its primary goal to contribute to the building of national capabilities for undertaking educational innovations linked to the problems of national development, thereby improving the quality of the people in the Member States.

All projects and activities within the framework of APEID are designed, developed and implemented co-operatively by the participating Member States through nearly 200 national centres which they have associated for this purpose with APEID.

The 29 Member States participating in APEID are Afghanistan, Australia, Bangladesh, Bhutan, China, Democratic People's Republic of Korea, Fiji, India, Indonesia, Iran, Japan, Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Samoa, Socialist Republic of Viet Nam, Sri Lanka, Thailand, Tonga, Turkey and Union of Soviet Socialist Republics.

Each country has set up a National Development Group (NDG) to identify and support educational innovations for development within the country and facilitate exchange between countries.

The Asian Centre of Educational Innovation for Development (ACEID), an integral part of the UNESCO Principal Regional Office for Asia and the Pacific in Bangkok, co-ordinates the activities under APEID and assists the Associated Centres (AC) in carrying them out.

In the fourth cycle of APEID (1987-1991), seven programme areas have been selected for the purpose of concentration. These are:

1. Universalization of primary education
2. Continuing education
3. Education and the world of work
4. Restructuring secondary education
5. Educational technology and information technology
6. Training of personnel including professional support services and distance education
7. Science and technology education including science for all.

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New Teacher
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